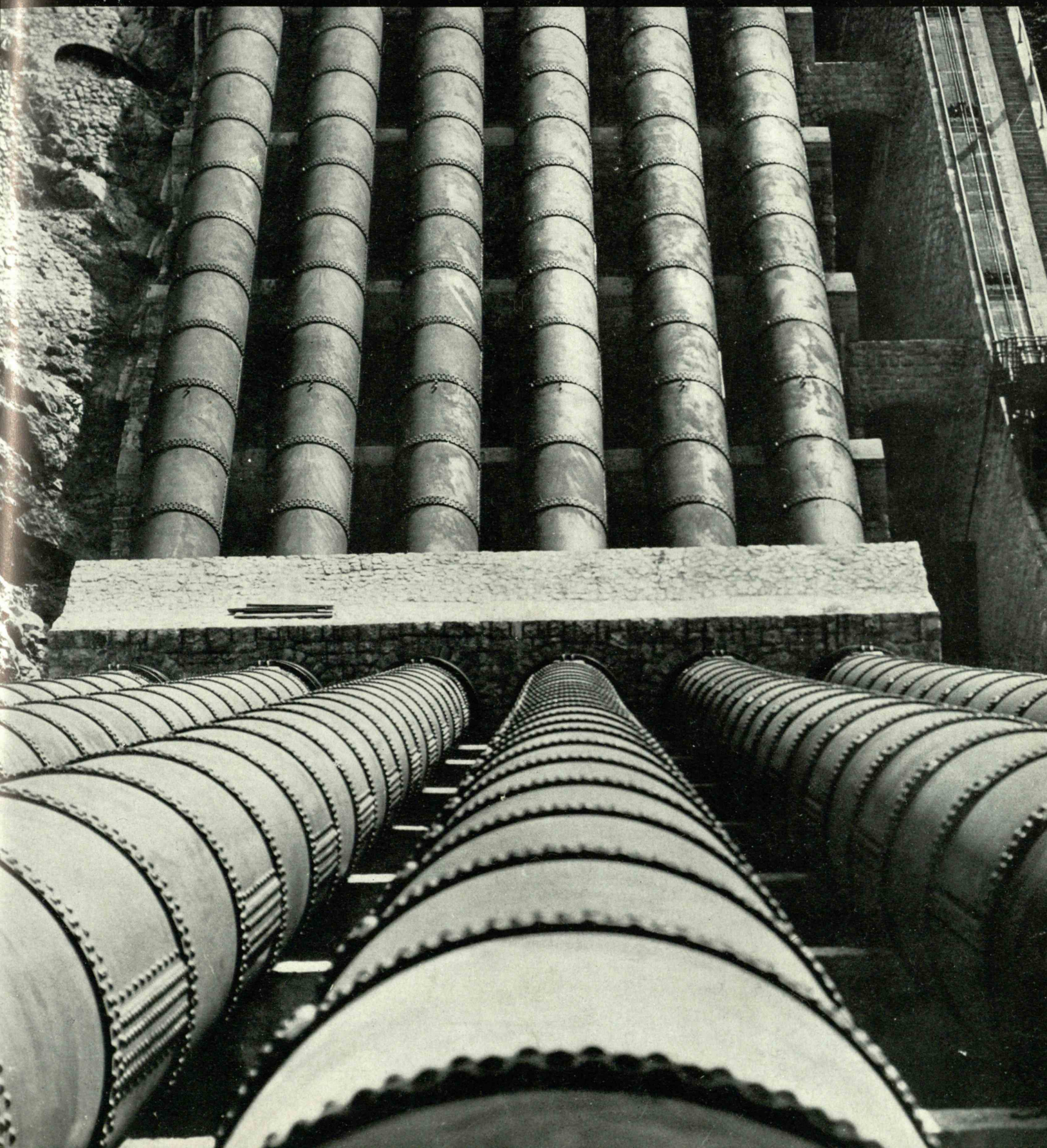


April 1937

TECHNOLOGY REVIEW

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technology review

Published by MIT

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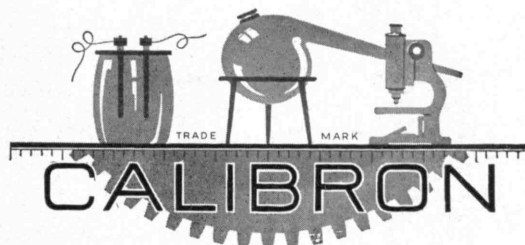
THE TABULAR VIEW

THE COVER

STAND this issue of The Review on a table or bookcase and view the cover photograph at a distance of about one foot. Then move backward, viewing the picture from successively greater distances. Note how the length of the pipes in the foreground seems to increase, the length of those beyond the anchorage, to decrease. Note, also, how the center pipe at the bottom rounds out, how the depth of the entire photograph increases.

This photograph shows, better than any other we have ever seen, the distortion that appears in photographs if they are not viewed from the correct distance. This distance should be such that the eye in viewing the print subtends the same angle as the camera lens in recording it. If you view a photograph of the same size as its original negative and if the picture was made with a lens of two-and-one-half inch focal length, your eye should be two-and-one-half inches from the photograph if no distortion is to occur. Of course the eye does not accommodate at such short distances, and the print should be enlarged to a size enabling the eye to view it at a distance of at least 10 inches (the minimum distance for good accommodation) if it is to be seen distortion free. For an interesting discussion of photographic distortion readers are referred to "Perspective Considerations in Taking and Projecting Motion Pictures," by A. C. Hardy, '18, and R. W. Conant, '23, in the *Transactions* of the Society of Motion Picture Engineers, Volume XII, Number 33, 1928, pages 117 to 125.

THE Tabular View in its capacity as toastmaster at the banquet table of this issue knows that introduction of two of the present contributors is not necessary for veteran readers. They have appeared before you more than once and have always been welcome. Thus, the following material about PHILIP M. MORSE and FREDERICK G. FASSETT, JR., both Review Associates, is for the few who do not know them as expositors and commentators. Dr. Morse, Associate Professor in the Institute's Department of Physics, is a graduate of the Case School of Applied Science and recipient of a doctor's degree from Princeton. He is the author of important papers dealing with the dissociation and energies of chemical molecules and has recently published a book on acoustics. On page 237 he stresses the techniques as well as importance of the new science of solids. Assistant Professor Fassett, ex-newspaper man and present inspiration and guide for undergraduate journalists at the Institute, displayed his philosophical bent in a "Soliloquy in a Laboratory," published in these pages in March, 1936. His article on page 235 is a provocative study of the relation of science and politics. **B. K. HOUGH, JR., '28**, who makes his bow as a Review contributor in this issue (page 232), is a civilian engineer with the Army Engineer Corps. At Passamaquoddy he was in charge of the soil mechanics laboratory. **ELISABETH COIT, '19**, is a New York architect.

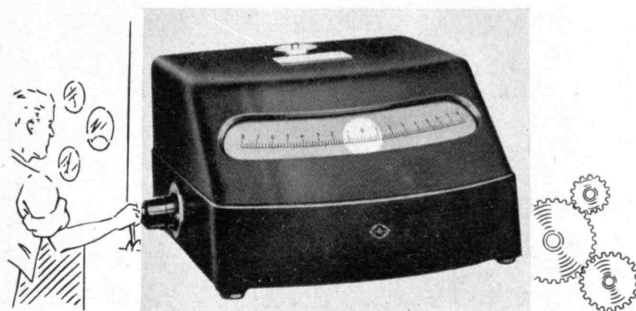


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MAIL RETURNS

OUT of the tourbillion of mental fireworks that greeted Professor Hudson's article, "Can You Solve Them?" came the following letter which we feel compelled to publish, despite a decision not to publish any of the reams of friendly letters which accompanied solutions to the problems.

TO THE EDITOR:

One of the two oldest living Alumni of M.I.T., Mr. D. M. Wheeler, C.E., 22 Harding Street, Pittsfield, Mass. — a dear friend of mine — handed to me a few days ago the March number of your Review, and in it I noticed Number 5 in "Can You Solve Them?" As it has that intriguing quality particularly attractive to a mathematical hobbyist, I am herewith inclosing the simple solution. Mr. Wheeler and, I think, one other member of the Class of '68 are in the nonagenarian class; Mr. Wheeler, still in excellent health, is consulting engineer on the N.Y., N.H., and H. R.R. I am also a "juvenile member" of the '76 Class, Worcester Polytechnic Institute, Worcester, Mass. Chatham, N. Y.

L. M. MUZZEY, C.E.

If we could hold the banquet we would like to have for all the genial brain-tester fans who participated in our contest, we would give seats of honor — seats of youth, if you please — to Messrs. Muzzey and Wheeler.

THE WINNERS

The following people (and note that they are not all men) are dubbed perfect or nearly perfect and worthy of entering into the exclusive inner circle where Review subscriptions are free: ROBERT T. BILLINGS, '32, Arlington, N. J.; ROBERT D. FAUNCE, '34, Manchester, N. H.; KARL R. KENNISON, '08, Waban, Mass.; PERRY H. WARE, '35, Medford, Mass.; (Miss) VERA WILSON, Newton, N. H.

Nine others missed only one problem each, and unless we hear objections from the individuals themselves, we will publish their names in the next Review along with any others whose answers arrive too late to catch this issue.

THE ANSWERS

No. 1. Fifteen inches. Note: This is an unstable position for a block of this density. In the stable position one corner of the block would be about 19 inches from the bottom of the tank. Either answer was accepted.

No. 2. James, where John had had "had had," had had "had"; "had had" had had the professor's approval. Note: The quotations "had had" and "had" may be interchanged in the first clause.

No. 3. The president is Mr. White; the professor, Mr. Brown; the instructor, Mr. Black; the janitor, Mr. Green.

No. 4. The percentage of water in the wine glass is the same as the percentage of wine in the water glass.

No. 5. The diameter is 58 inches.

No. 6. Nine trains.

No. 7. (a) The use of "46 B.C." as a date would have been prophetic. (b) The names of kings are not numbered until there is more than one of the same name. Note: While not intended to be an examination in numismatics, all valid answers utilizing numismatic lore were accepted.

No. 8. Four weights: 1, 3, 9, and 27 pounds placed in either pan.

No. 9. Typical answers: $99+9-9+\frac{9}{9}$; $(9+\frac{9}{9})(9+\frac{9}{9})$;

$$9 \times 9 + 9 + 9 + \frac{9}{9}; \frac{999-99}{9}; \frac{99}{9} \times 9 + \frac{9}{9}; (99) + \frac{9}{9}; \frac{99+\frac{9}{9}}{\frac{9}{9}}; (99+\frac{9}{9})^{\frac{9}{9}};$$

and so on. Note: One respondent was able to send in only 1,227 combinations!

No. 10. He said that he was a knight, because nobody in that country would answer otherwise.



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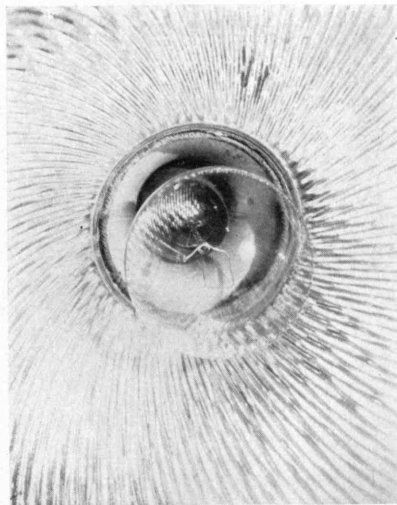
Ordinary Rubber Belt—200 lbs.
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THE TECHNOLOGY REVIEW

Title Reg. U. S. Pat. Office

EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

VOL. 39, NO. 6

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From a photograph by Hoppe from *Black Star*
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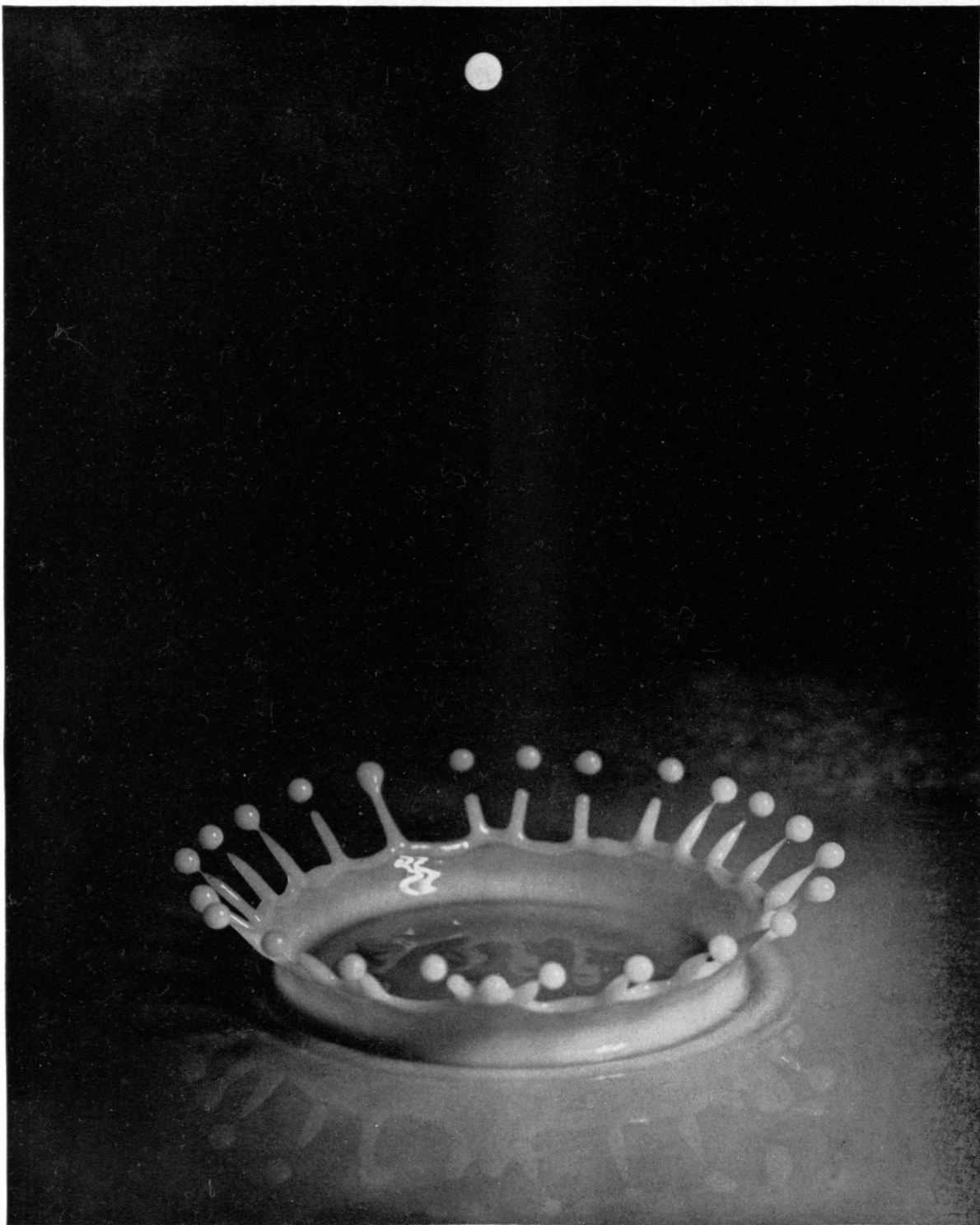
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PHILIP M. MORSE

JOHN J. ROWLANDS

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Edgerton, Germeshausen, and Grier

FOR THE CORONATION SEASON

The high-speed camera captures a new design for coronets. At the top is another drop on its way to form another coronet

THE TECHNOLOGY REVIEW

Vol. 39, No. 6



April, 1937

The Trend of Affairs

The Proper Study of Mankind

SCIENCE, through the misuse of which man has created a world inimical to himself, may yet, if properly put to work, save man's civilization. But for this end to be achieved, it is essential that man apply his science to himself. So argued Dr. Alexis Carrel of the Rockefeller Institute, in an address upon the occasion of his receiving the Cardinal Newman Award for 1936 at the University of Illinois recently. Suggesting that civilization is breaking down because, though constructed by men for men, it is calculated for men who do not exist, he maintained that the "dreams of sociologists and philosophers" are not a solid base for a culture. "Man differs profoundly from the abstractions created by economists, social workers, psychologists, physiologists, educators, historians, and other specialists," Dr. Carrel declared. "He is a concrete object, which must be apprehended directly and not viewed through philosophical or scientific systems."

But this concrete object has a soul, which modern society, concerned exclusively with the dissection of man, has separated from the body and then neglected, Dr. Carrel asserted. The application of science to man, which he desires, would not merely synthesize the various specialized departments of knowledge concerning man; it would go on to deal "not with mere aspects of man, but with man as a specific entirety inserted in a group, a nation, and a race." By this means, civilization may be based on the knowledge of man as he really is, and so it must be based, Dr. Carrel held, if it is to endure. To implement the process he suggested a new institution to be called an institute of man or institute of civilization, which should be the center of study of man as "the individual, a physiological and spiritual whole bound to his environment."

Dr. Carrel's pronouncement epitomizes an event which Dr. Max Mason, former President of the University of Chicago, now of the California Institute of Technology, declared a turning point in human history — the realization by scientists that "the proper study of mankind is man." Dr. Mason's statement was made before the American Medical Association's congress of medical education and licensure, whom he told that "our need is now adaptation to our self-made social environment. We must consciously control our mental and physical growth."

One avenue to this conscious control and to the dissemination of acquaintance with science that probably must precede the application of science to mankind, urged by Dr. Carrel, was opened recently by Dr. Frederick P. Keppel, President of the Carnegie Corporation of New York and self-styled philanthropoid. Addressing a gathering of representatives of foundations administering funds in aid of research, Dr. Keppel called upon them to coöperate in a nation-wide clearing house for the popular diffusion of scientific knowledge through adult education. The oldest learned society in the country, the American Philosophical Society, he invited to undertake the task of supervising the establishment of relations between leaders in science and the agencies of adult education.

In spite of American leadership in many scientific fields, Dr. Keppel said, science is generally a neglected subject; classroom opportunities for its study by adults through such means as extension courses are less than six per cent of the total offering. Asking whether the individual American adult had not the "right not merely to worship but to learn," Dr. Keppel chided most colleges and universities engaged in adult education thus far for having "interested themselves almost exclusively in the adult who has a vocational rather than cultural

incentive for further study," and asserted that the college doors must be opened, laboratories and study collections must be made available, and traveling scientific units must be provided to serve areas lacking fixed facilities. Funds for such a program should come in part from the cooperating foundations, he maintained, and in part from student fees, public moneys, and individuals.

Dr. Keppel's listing of intellectual assets included about 2,500,000 living graduates of colleges and universities. The scheme of adult education in science which he proposed may be expected to aid in correcting an intellectual anomaly pointed out by Dr. Joseph K. Hart, Professor of Educational Psychology at Teachers College, Columbia University, who declared in a recent study that though America has more Ph.D.'s per square mile than any other population has ever had, it cannot claim as many first-class minds as could have been found in Attica about 430 B.C. in a population about one per cent as large. Should the Keppel plan contribute to the development of more first-class minds, they in turn, through the Carrel program, may work toward the correction of the gloomy biological picture presented by anthropologists who see the race degenerating through the use of science to keep the unfit alive and breeding.

Vital Statistics of Steam

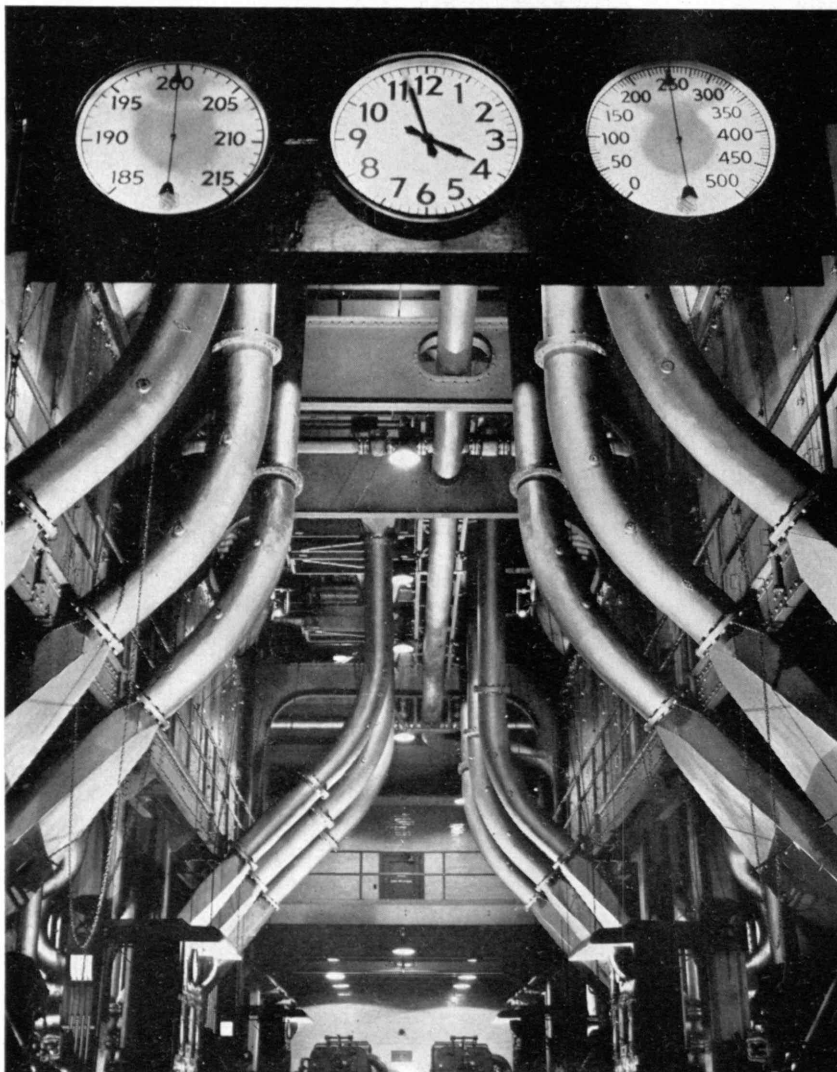
IN determining the performance of projected steam power installations, the power-plant engineer and the mechanical engineers who build his equipment have recourse to sets of tabulated data on the properties of steam. These steam tables, so called, are of vital assistance not only in the preparation of estimates for an installation but also in the construction of plants. In past years engineers used to limit their equipment to pressures of 200 or 300 pounds per square inch, and to temperatures of 500 or 600 degrees F.; for these, previously existing steam tables were sufficient.

Nowadays, however, in the well-designed power plant, pressures to 1400 pounds per square inch, and temperatures to 800 degrees F. are not unusual. The temperatures are still going up; the advantages of still higher pressures are continuously being explored; and the formerly satisfactory steam table, as a result, is outmoded. Many other demands, less extreme than those of the plant engineer, but nevertheless exacting, are put on the steam table by the manufacturer of condensers and the air-conditioning engineer. Beyond these are the requirements of the scientist, who asks of the table precise and definitive data concerning water in its various phases.

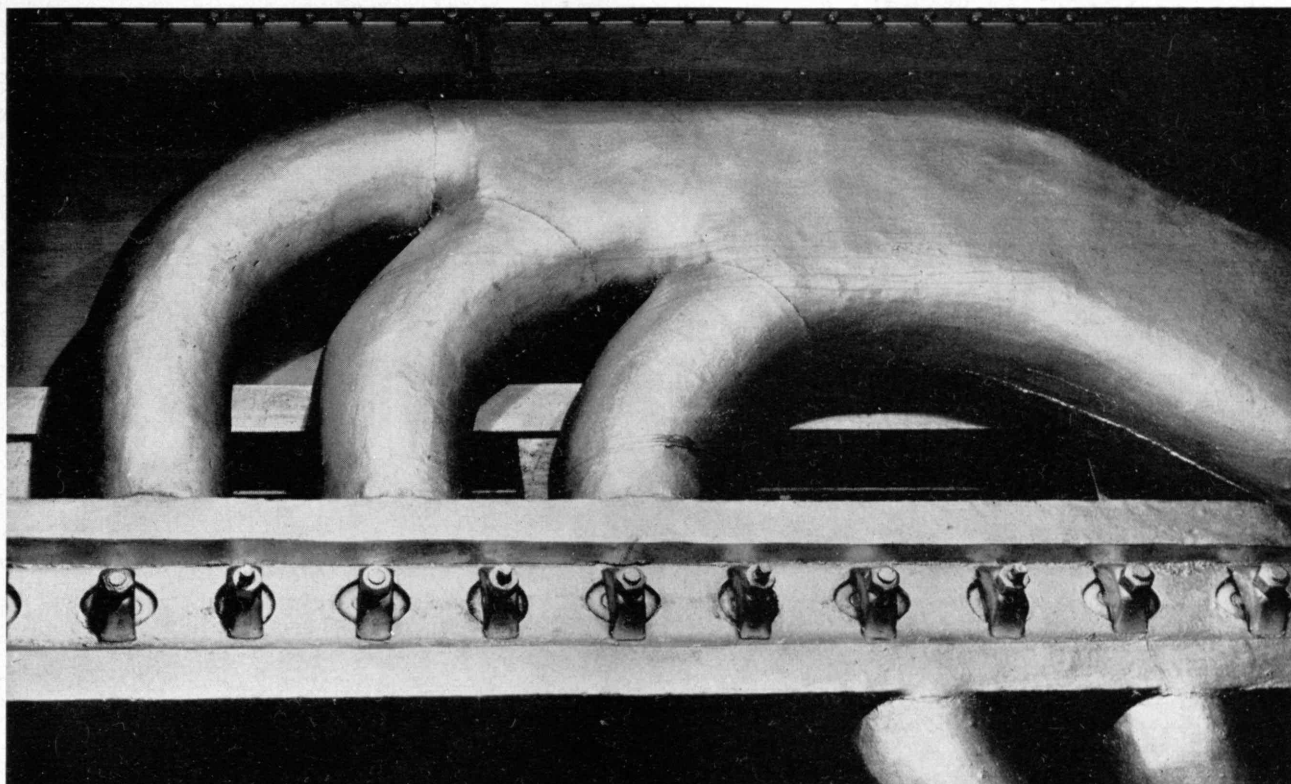
These circumstances mark the importance of the completion of a long series of investigations and the publication, as a result, of "Thermodynamic Properties of Steam Including Data for the Liquid and Solid Phases," by Professors Joseph H. Keenan, '22, and Frederick G. Keyes of the Institute. Through their work, the properties of steam have been detailed more precisely than ever before, and they have been determined to 5,500 pounds per square inch and to 1,600 degrees F.

The most important part of a steam table, covering the usual working range of steam-engine practice, is roughly bounded by the saturated liquid line at the bottom and the 900-degree F. line at the top, with pressures extending from a small fraction of one pound to 200 pounds per square inch. This part of the table is now determined with a high degree of precision. But, since there is usually more than one way to solve a problem with steam-table data, of almost equal importance with precision is the consistency attained.

First of all a matter of smoothness, consistency requires that not merely the difference between adjacent tabulated figures but even the differences between differences of differences must vary in an orderly fashion. More than this, consistency



F. S. Lincoln, '22



F. S. Lincoln, '22

FORTY-TWO WASHINGTON BUILDINGS

... are heated by the \$2,200,000 central heating plant in which the above and opposite interior photographs were made. Exteriorly, this plant, which supplies steam to government buildings in the "Triangle," is one of the most beautiful power structures ever built

means also the satisfying of numerous relations connecting, for example, volumes and entropy, entropy and enthalpy, upon which the first and second laws of thermodynamics insist. All of these requirements have been met in a most remarkable fashion through the Keyes equation of state for steam.

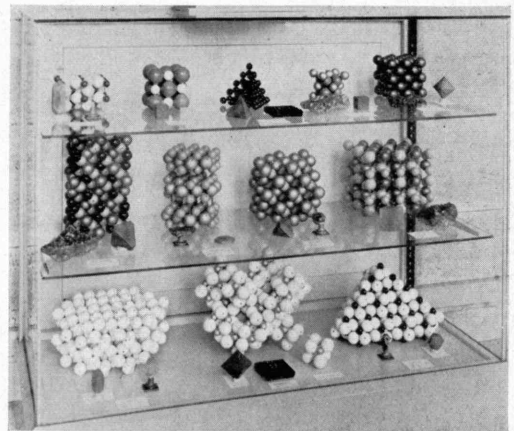
This equation is an algebraic statement of the results of two extensive experimental projects on the properties of water vapor which have been carried out in the laboratories of the Institute. The first involved the measurement of specific volumes to a precision of the order of one part in two thousand. Because at low densities adsorption of the vapor on the walls of the container introduced appreciable error, this measurement was limited to relatively high densities. At low densities, the investigation was continued in the second type of experiment, which involved the flow of steam through a capillary tube in which was coiled a platinum resistance wire. With this apparatus were determined the rate of change in temperature with drop of pressure at constant enthalpy (the Joule-Thomson coefficient), and the rate of change of enthalpy with drop in pressure at constant temperature (the constant temperature coefficient).

Properties of steam in this important region can of course be ascertained by means of data from various other sources. These include an excellent series of calorimetric measurements of saturated liquid and saturated vapor made at the Bureau of Standards, calorimetric measurements of superheated vapor made in England, extensive measurements of the same kind

from Czechoslovakia, and several kinds of measurements from Germany. In the event of conflict between the indications of the equation of state and these other values, a choice would have to be made. No serious conflict has been encountered. All the more recent and more precise experimental work has yielded values in close accord with those deduced from the equation of state, serving to confirm, in short, the work of Keyes and his associates, Drs. Leighton B. Smith, '19, Harold T. Gerry, '29, and Samuel C. Collins, all of the Institute.

Other ranges of the states of water, though of less importance than that just discussed, are nevertheless of great interest to the engineer and scientist. The compressed liquid, which is liquid under a pressure higher than its vapor pressure, is of next importance. Here, measurements from Technology's laboratories by Drs. Keyes and Smith form the basis of the development. The analysis, a combination of graphic and algebraic devices, was carried out a few years ago by Professor Keenan, and once more measurements from Germany and Czechoslovakia confirm the findings.

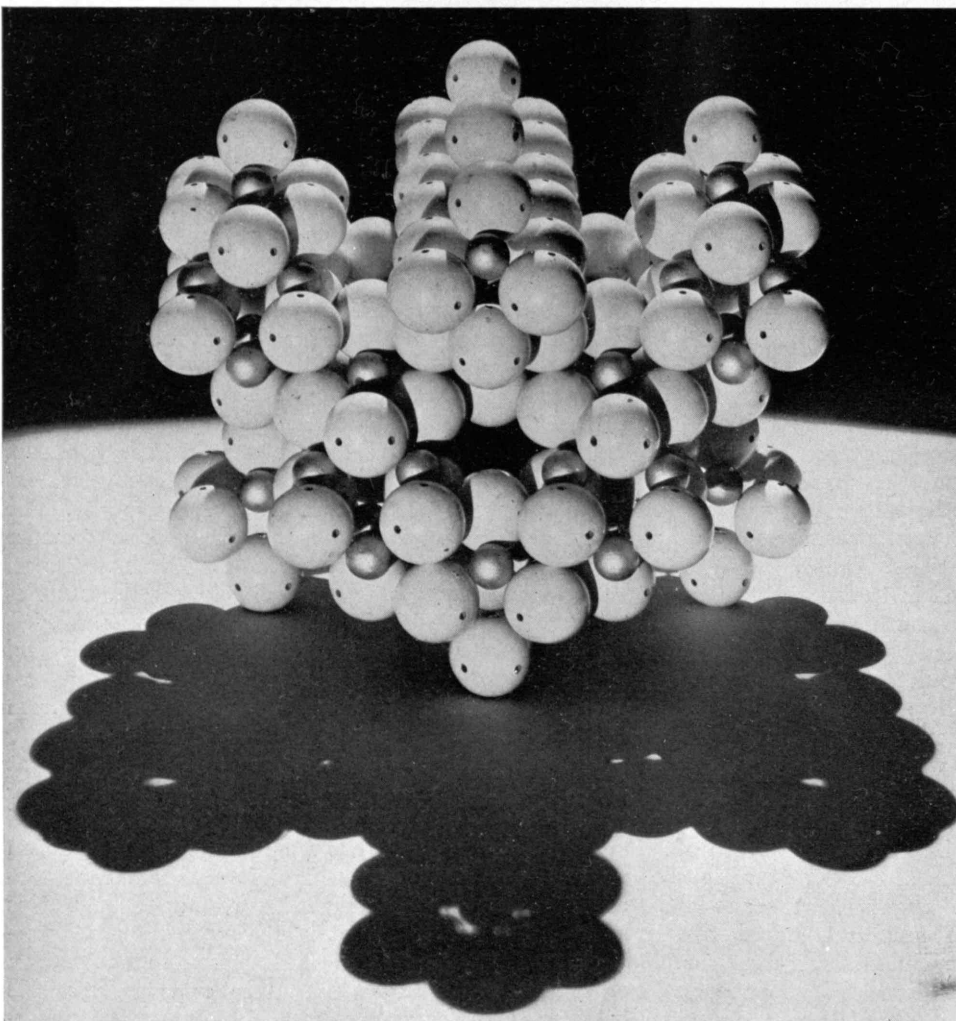
The region embracing the critical point, that point at which latent heat vanishes and the liquid and vapor are indistinguishable — extending from the compressed liquid region to the high-pressure limit of the equation of state — had never before been formulated. The measurements of Keyes and Smith extend through this region, but they occur at relatively infrequent intervals, so that attempts to formulate them in an equation of state were unsuccessful, and the large intervals between them made any graphic analysis most uncer-



M.I.T. Photos

ATOMIC MANIKINS

In solving the solid-matter mystery (see page 237) scientists study the ways atoms congregate to form crystals. From data supplied by x-rays and by other methods of analysis, it is possible to construct models of atoms such as those shown above and below. These models are the result of a new technique of modeling crystals developed by Professor M. J. Buerger, '24, of the Institute's Department of Geology. To the left is the atom factory where, with the aid of special jigs, wooden balls representing atoms are bored (after being painted) at the proper angle to relate them to companion atoms



CRYSTAL SCULPTURE

. . . this might be called. The white balls are oxygen atoms; the smaller, dark ones, antimony. Joined together in the pattern shown by the model the mineralogist calls them senarmontite, one of the two forms of Sb_2O_3

tain. Measurements of enthalpy made by Havlíček in Czechoslovakia were drawn upon to bridge the gap. Occurring with greater frequency than the volume measurements, they were adequate guides for a semi-graphic formulation which was kept under rigid control by being fitted precisely to the volume measurements. For the first time, as a result of this work, a steam table is continuous between the liquid and vapor phases.

On the Insect Front

DROUGHT, soil erosion, and floods are uppermost in the public mind just now as elemental enemies of our security; their dramatic impact has temporarily crowded from the front page the greater menace of pests — those plants, insects, and animals which are dangerous competitors for the world's food supply.

Past centuries of direct offensives against these hosts — of burnings, poisonings, Pied Pipers, and mass executions — have failed to do more than effect a costly stalemate on the longest front on which mankind battles, and it has remained for biological studies of the present century to show how certain pests, at least, can be brought under control by methods whose subtlety combines diplomacy with science. By pitting against creatures whose numbers or habits make them obnoxious, natural enemies which they have escaped by emigration or have never encountered, man is able to shift the balance of nature in his favor.

Australia, whose long isolation has made it a paradise for recently imported forms of life toughened by geologic ages of struggle in less comfortable lands, is now profiting from a successful application of this principle. In 1925, some 60,000,000 acres in Queensland and New South Wales were so badly infested with the prickly pear as to be useless for agriculture, while the plant was spreading at the rate of 1,000,000 acres a year. Since this colossal area could hardly be treated like a weedy garden, government research workers undertook a systematic study of the prickly pear in North and South America, during which every possible enemy of the plant — insect, bacterial, or fungal — was investigated.

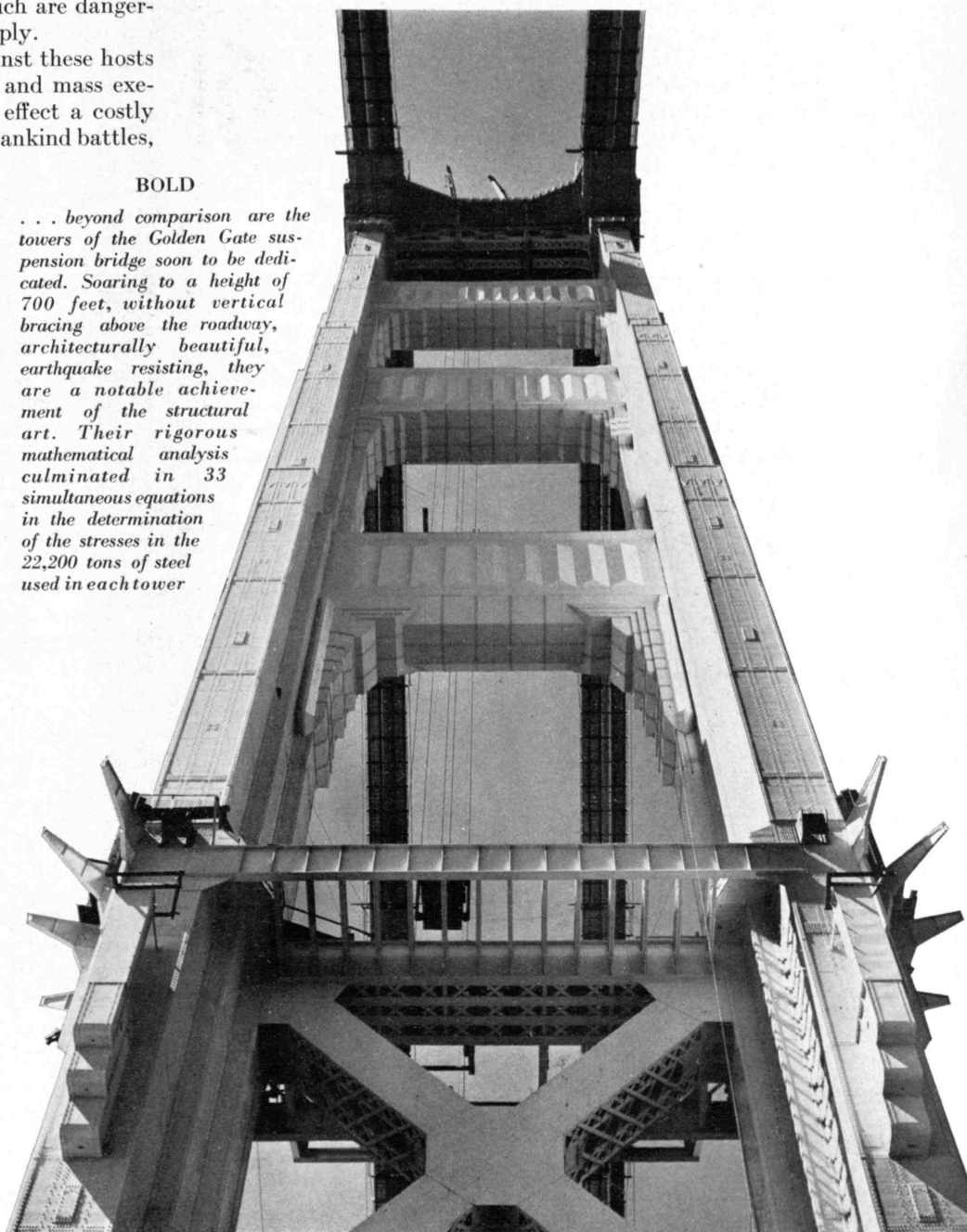
The thoughtless tinkerer with the balance of nature, like the amateur at the switchboard of a central station, is sure to obtain unexpected, and sometimes calamitous, results. Not only do parasitic and predatory creatures introduced designedly to combat some pest sometimes fail to survive; they can also become an enemy instead of an ally. Witness the English sparrow in this country, the mongoose in tropical regions.

Of the 145 species of insects which were found to feed only on the prickly pear or other *Cactaceae*, several were considered satisfactory for trial in Australia. One, a phycitid moth, proved particularly effective, and, from the 2,750 eggs which were originally imported from Argentina, there were bred 3,000,000 descendants which, with their children and children's children, have reduced the domain of the prickly pear to about ten per cent of its former area. The gregarious larvae of this insect assemble in companies and tunnel through the tissues of the plant, destroying them and also offering ingress to various microorganisms which finally reduce the plant to a rotting mass of pulp.

The Australian government is now applying this principle of natural control to its most widely publicized

BOLD

... beyond comparison are the towers of the Golden Gate suspension bridge soon to be dedicated. Soaring to a height of 700 feet, without vertical bracing above the roadway, architecturally beautiful, earthquake resisting, they are a notable achievement of the structural art. Their rigorous mathematical analysis culminated in 33 simultaneous equations in the determination of the stresses in the 22,200 tons of steel used in each tower



immigrant, the rabbit. In other lands the rabbit is a docile little beast which serves as a pet for children, a source of sport for hunters and of profit for farmers. In Australia it is, as a prime element in an ecology seriously out of joint, public enemy number one, which every farmer must destroy under penalty of a heavy fine. But although Australia exports some 70,000,000 rabbit skins every year, the supply remains as copious as ever. Fences, organized hunts, and hearty cursing of the misguided person who first brought this pest into the country have proven only partially effective.

Not unlike Faust calling up the devil, scientists now propose to invoke the most malignant of the four horsemen — pestilence — and let loose upon the rabbits a specific virus which, spreading only by contact from animal to animal, creates the fatal disease known as myxomatosis. According to the *New York Times*, researches in England show that the disease will wipe out confined colonies. It is now proposed to test this virus in the field, once its effects on all kinds of Australian animals are known — by inoculating some rabbit-infested island and, in this natural laboratory, finding its characteristics with certainty.

With this and other less spectacular attempts at biological control, man takes one more step toward that variously pictured Utopia in which man's sole remaining enemy will be man.

Match of Matches

ACCORDING to the comic strip, it was once standard practice for an intrepid explorer, brought before the chieftain for final inspection before boiling, to drag out his last match, light it, and then be elected official witch doctor by the astonished savages. Today, were there any unsophisticated cannibals left, he could elaborate by blowing out the match, then lighting it again.

From Sweden comes the news of the first really fundamental improvement in many years in that industry so effectively publicized by the late Kreuger — a repeating match. A core containing chemicals which will ignite

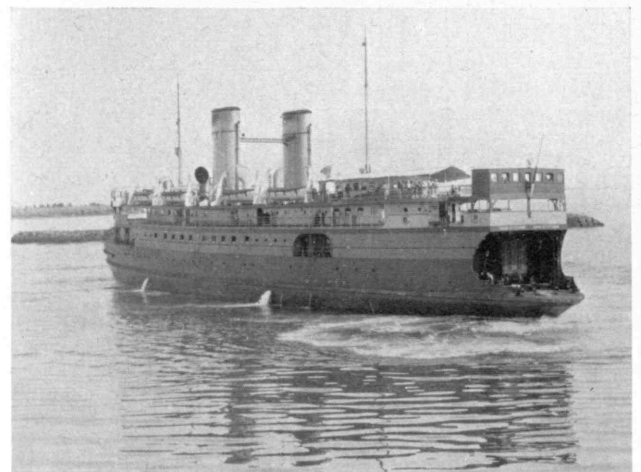
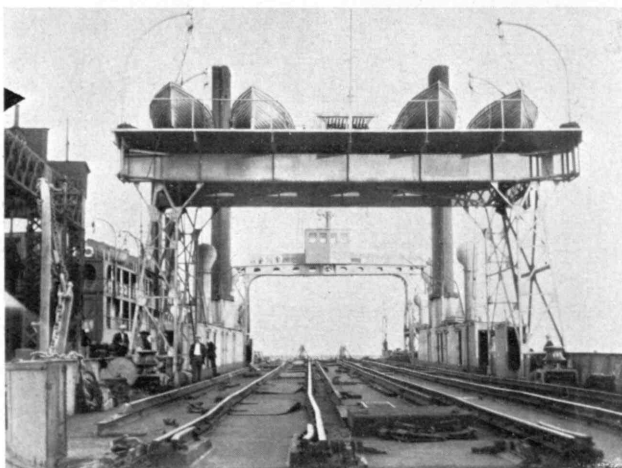
by friction is diluted with compounds which cause it to burn at the same rate as a slow burning sheath around it. Struck in the usual manner, the match will burn till blown out. To relight, the core is merely scraped again against a suitable surface. Probably not able to compete economically with the usual match forms, it may, nevertheless, become popular for pocket use, where it can be carried in a special case and serve much the same function as a lighter.

Ferries for Trains

ACHORUS of acclaim rightfully hailing the two new mighty San Francisco bridges obscures the impending completion during 1937 of a contemporary Danish structure which is scheduled to close the two-and-a-quarter mile gap between the islands of Zealand and Falster. This, the Storstrom Bridge, becomes the longest in Europe, with main spans adding up to 10,500 feet. Its construction has involved well over 26,000 tons of steel and it rests upon some half a hundred piers, the setting of which has been attended by peculiarly difficult problems of depths and currents.

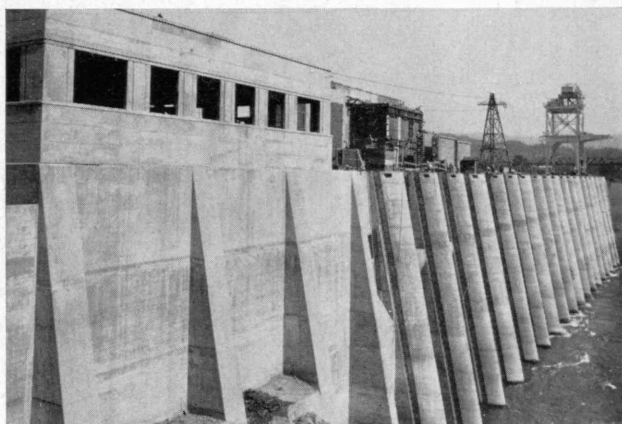
Of equal interest, however, is the fact that the Storstrom, like its recently opened companion, the Little Belt, is a railroad bridge to displace one of the seven remaining train-ferry links, some of which have been used more than 60 years to maintain traffic between the islands of Denmark and the mainland. Save for the occasional opening of a bridge built for such a purpose — other recent examples being the crossing of the Mississippi at New Orleans to supersede train-ferry services of long standing maintained by the Southern Pacific and the Texas and Pacific, and the 12,064-foot Lower Zambesi Bridge (world's longest continuous overwater steel railway structure) to give direct rail connection between the highlands of Nyassaland and the port of Beira in Portuguese East Africa — the extent to which routes are intercepted by waterways is ordinarily unappreciated.

The hazards of fog and dense marine traffic led to the abandonment of ferrying through passenger traffic in New York Harbor 25 years ago, first by using a route

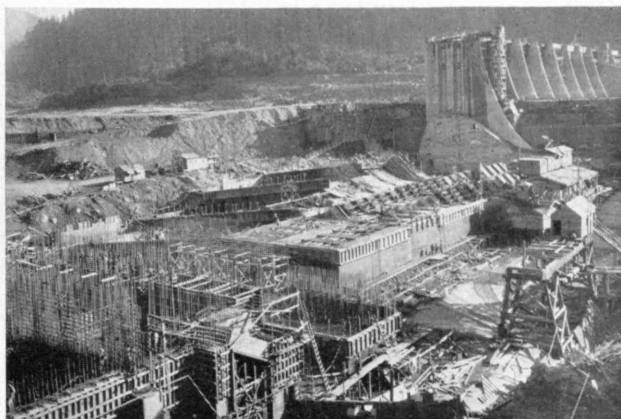


TRAIN-FERRY LINKS (SEE ABOVE)

Left. Canadian National's car ferry at Mulgrave, Nova Scotia. Right. The most powerful ice-breaker train ferry afloat is the Charlotte-town, built in 1931 for use between the New Brunswick mainland and Prince Edward Island



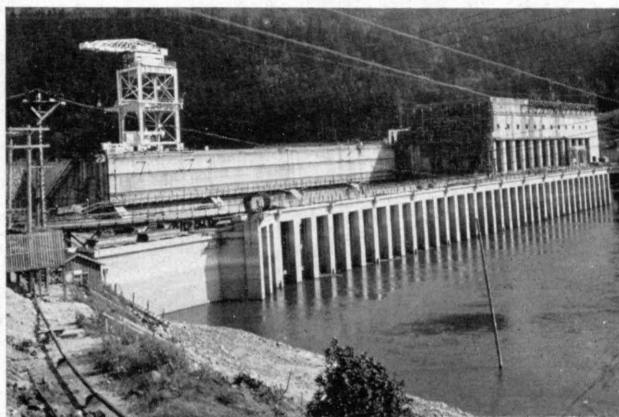
POWER HOUSE, DOWNSTREAM SIDE



NORTH HALF OF DAM

BONNEVILLE

By the end of this year Bonneville Dam on the Columbia River, 43 miles east of Portland, Ore., should be in operation, and Congress is studying ways of selling surplus power left over after the operation of its navigation locks and spillways. Built mainly to aid navigation, the project includes a single-lift ship lock which will raise boats 66 feet, higher than any other lock in the world, and permit oceangoing vessels to reach the Dalles, a distance of 187 miles from the mouth of the river. Interesting, too, are the fish locks and ladders designed to enable salmon to migrate over the dam and thereby conserve the Columbia River's \$10,000,000 salmon industry



Corps of Engineers, U. S. Army

POWER HOUSE, UPSTREAM SIDE

across the then new cantilever bridge at Poughkeepsie and later via the Hell Gate Bridge and tunnels under the East River and the Hudson. Yet even today there are some 150 tugs, over 300 car floats, and nearly 1,200 lighters, barges, and other craft engaged in the transfer of freight in interchange services between piers and terminals in New York Harbor. All this involves an investment of \$50,000,000 and a weekly pay roll for 3,400 men, averaging \$200,000.

Train ferries serve not alone to cross rivers or narrow and sheltered straits but some have relatively long routes on large lakes or open seas as E. E. R. Tratman recently made clear in the *Bulletin* of the American Railway Association. Across Lake Michigan, for example, six railroads operate a fleet of 20 large train-ferry ships on nine routes where both bridges and tunnels are out of the question, varying from ten miles at the Straits of Mackinac to 100 miles from Frankfort and Manistique. Because of the lengths of these routes and the frequent storms which are prevalent on the Great Lakes, these Lake Michigan ferries are sturdy craft, amply powered, with a high freeboard. Their train decks are covered and otherwise inclosed and, aside from stern or bow openings to admit cars, their appearance is that of other lake or ocean cargo carriers. In winter, severe ice conditions are encountered which have sometimes led to the installation of a bow screw, particularly useful to cause a down suction of water under massive, solid ice, thus breaking a channel.

The most powerful ice-breaker train ferry afloat, however, is the *Charlottetown*, built in 1931 for the Canadian National's use across Northumberland Strait between the New Brunswick mainland and Prince Edward Island, a distance of nine miles. This ferry is 324 feet long with a registered tonnage of 3,385, 8,000-horse power engines, and a capacity of 16 freight cars.

Though untroubled by ice, the Key West-Havana service, after 20 years, was obliged to shift its American terminal northward to Port Everglades after the hurricane of 1935. This increased its route from 90 to 270 miles, a distance surpassed only by that of the truly ocean-going *Seatrains* *New York* and *Havana*, which have been plying between New York, Havana, and New Orleans. These ships are 478 feet in length, with a beam of 64 feet, and are driven by geared turbines of 8,800 horse power. They have a capacity of 100 cars on four decks, loading being accomplished through deck hatchways by overhead cranes.

Ordinarily the method of loading and unloading of train ferries is to have a locomotive push the cars on the boat or pull them off, rail connection with the dock being maintained over a hinged apron or span. Once the ship is securely moored, this takes place with surprising speed, the average time for handling a freight car on 15 American ferries being 1.15 minutes for unloading and 1.32 minutes for loading. Arrangements must be provided for tidal fluctuations and other changes of water level. In one instance, that of a ferry operated across

Collaring the Colorado

ENGINEERS, when referring to the Colorado River Aqueduct project, which is now within two years of its expected completion, usually do so with such phrases as "our greatest construction project," or "world's largest engineering feat." The reasons for such superlatives are readily understood: When completed, the aqueduct will carry 1,500 cubic feet of Colorado River water per second (one billion gallons daily) from a point 150 miles downstream from Boulder Dam, across the state of California, to the 13 cities which have formed a confederation known as the Metropolitan Water District of Southern California. The entire \$220,000,000 cost of the undertaking will be paid by these municipalities, Los Angeles being the largest. The aqueduct has a total length of 392 miles (242 miles of main aqueduct and 150 miles of intercity distributing system). Along this length are 108 miles of tunnels, 54 miles of cut-and-cover conduit, 29 miles of siphon-pressure-pipe, a diversion dam near Parker, Ariz., a terminal reservoir south of Riverside, Calif., three intermediate storage reservoirs, five pumping plants.

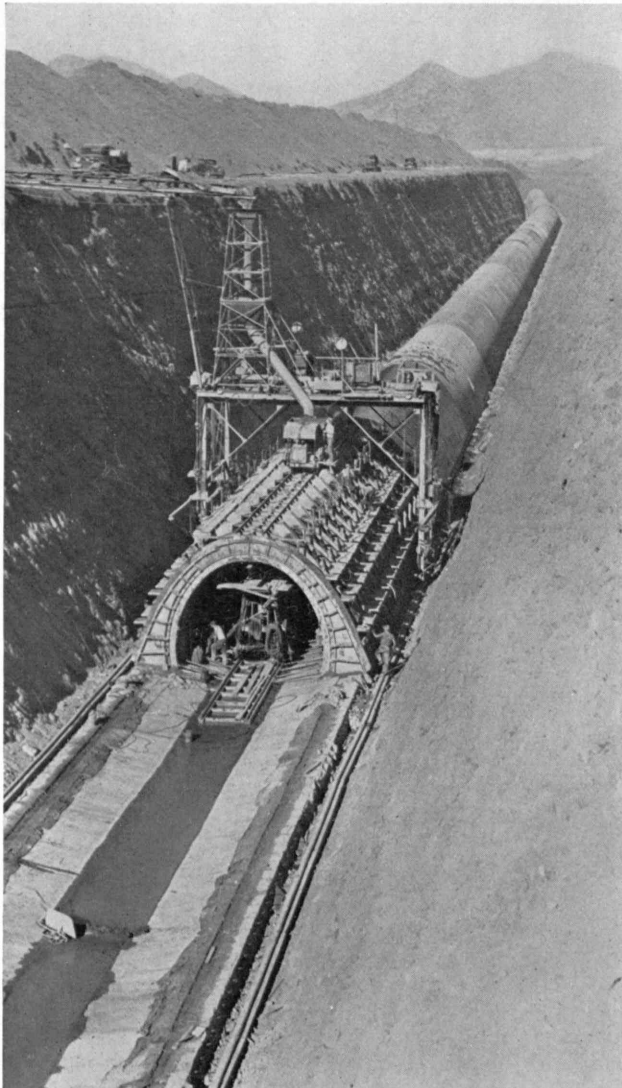
Most impressive links in the system are the tunnels. Those on the aqueduct's main portion are lined with a foot of concrete and are 16 feet in diameter. Longest of the 37 tunnels is the 18-mile East Coachella bore. Most difficult one is the 13-mile San Jacinto, where large quantities of water under high pressures are delaying construction. It is estimated that by the time the tunnels are completed, 111 crews will have drilled approximately three million blasting holes and exploded ten thousand tons of water-resistant dynamite.

The conduit shown in the photograph, upper left, is the type used on the main part of the aqueduct. Its inside diameter is 16 feet. Portable steel forms are used to set the arch section, and the arch is proportioned to withstand external loads. The photo shows the arch being poured from a concrete mixing plant at the site.

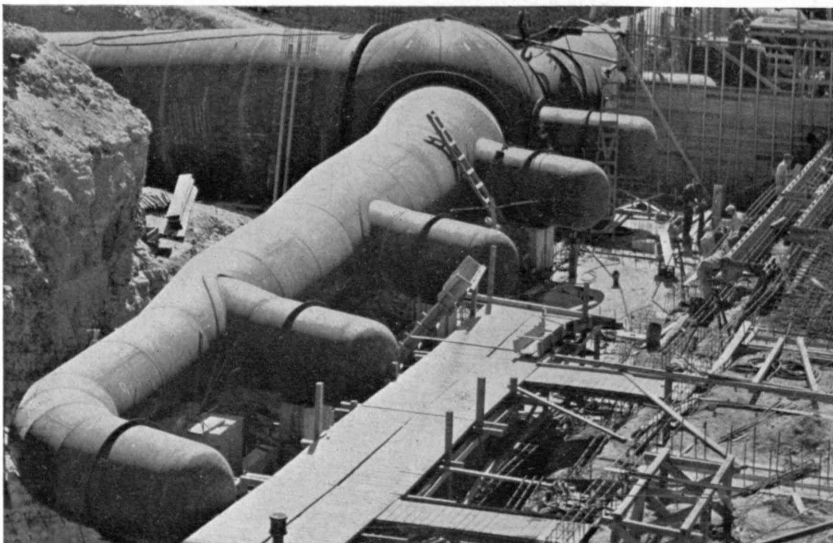
The aqueduct's concrete siphons, which carry the water across declivities and are linked to the tunnels by conduit, do not exert any siphonic action but are merely pressure pipes in which the water will find its own level after plunging to the bottom of one of the desert canyons. The siphon in the photograph, lower right, is a steel-reinforced monolithic type, not poured in sections but as one piece of masonry.

The photograph, lower left, shows the installation of a steel manifold section for one of the five pumping plants. These will receive electric power from Boulder Dam and lift water a total of 1,600 feet. Each plant will be equipped with a centrifugal pump twice as large as any ever used before.

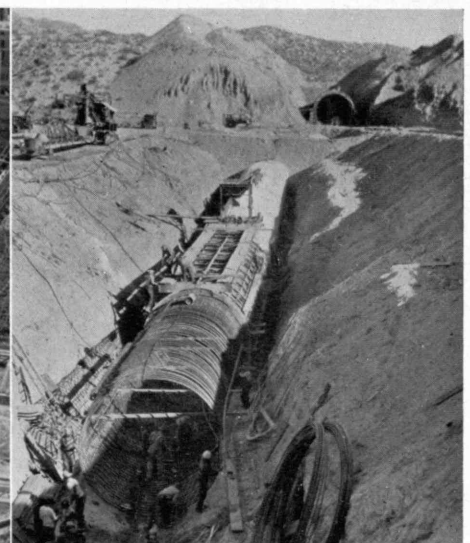
(Photos by Metropolitan Water District)



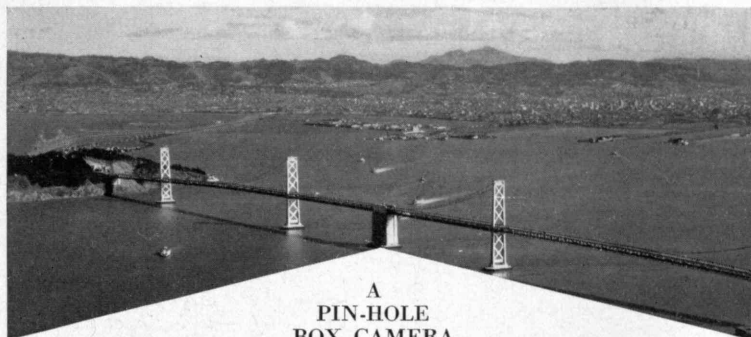
TRAFFIC: ONE BILLION GALLONS A DAY



ONE OF THE GIGANTIC MANIFOLDS

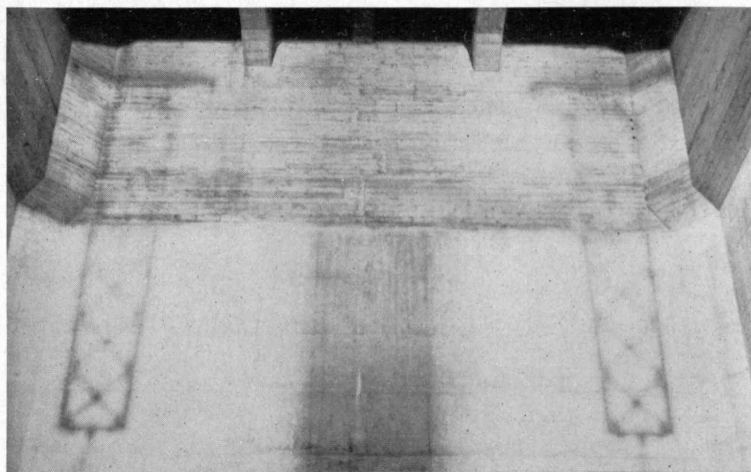


NONSIPHONIC SIPHON



A
PIN-HOLE
BOX CAMERA

... probably the largest in the world was discovered during construction of the San Francisco-Oakland Bay Bridge in the center anchorage of the suspension section shown above. The two inverted images (seen below) of one of the main suspension towers pass through two windows — each, six by ten feet — and focus on the walls of one of the main cells of the anchorage. This anchorage is greater in bulk than Egypt's largest pyramid



Gabriel Moulin

the St. Lawrence previous to the opening of the Quebec Bridge, a tidal range of about 18 feet was cared for on the boat by a car deck which could be moved up and down some 20 feet. It is usual, however, when this problem is too acute to be met by a single hinged apron, to arrange a series of spans or a cradle with a track on its deck. (The Missouri-Pacific Mississippi River car ferry adjusts itself to a 40-foot difference in water level.) Recently, for the comparatively new Dunkirk-Dover cross-channel service, making through Paris-London sleeping-car arrangements possible, the extreme variation of high and low water at Dover (25 feet) precluded the adoption of an inclined approach, and a dock with gates was built. The minimum depth of water over its sill permits an approaching ferry to enter at any stage of tide, following which the gates are closed and sufficient water may be pumped in to raise the rails on the boat's car deck to the level of those on the dock.

The *Twickenham Ferry* and its two sisters, built for this Dunkirk-Dover service are considerably larger than any previously used in the Channel, being 359 feet in length with a beam of 63 feet, 9 inches, and a mean laden draft of 12 feet, 6 inches. They accommodate 12 sleepers and two baggage cars, and are designed for a speed of $16\frac{1}{2}$ knots. Other notable instances of the modern trends in train-ferry craft are the Danish *Nyborg*, built in 1931, with a length of 333 feet and a beam

of 56, powered by eight-cylinder Diesel motors and capable of $15\frac{1}{4}$ knots; the 347-foot German *Schwerin* and its slightly longer Swedish companion, the *Drottning Victoria*, which also operates on the international 66-mile Sasnitz-Tralleborg route; and the two Italian 360-foot, triple-engined Diesel-electrics, *Scilla* and *Cariddi*, put into service six years ago across the Strait of Messina between Sicily and the Italian mainland.

Why Does Concrete Crack?

THE modern construction engineer is yearly relying more and more upon concrete in his work. In the past two decades, for example, the use of Portland cement has tripled. In a material as important and widely used as this, an improvement of one-tenth of one per cent in quality or economy would justify the lifetime work of several men. Its full potentialities have not yet been realized, because we do not clearly understand it.

The effectiveness of concrete depends upon a sub-microscopic molecular process which is beyond the grasp and — so far — beyond the manipulation of man. When Portland cement is hydrated, there ensues a phenomenon having some of the characteristics of life itself — the growth of the remarkable and mysterious material known as gel. With the advent of moisture, the gel spreads in a brushlike frame from the surface of each cement grain, gradually filling first the smallest and then the larger voids between particles of the aggregate, in such wise as to produce concrete. Once the pores have been filled, the gel continues to grow stronger and denser. The farther it has to grow, however, the sparser it becomes.

Now in an average concrete, only a small proportion of the cement grains are used to grow the gel and only a small part of the potential gel-producing ability is needed. Consequently a waste occurs which is in sum very great, even though its origin is in a submicroscopic world. The obvious answer to this problem is to cut down the proportion of cement used in a concrete. This answer is not, however, a good one, for omitting part of the cement means that many voids of large size will be filled with a gel that is weak because it has had to grow out farther from the mother grain. Changes in volume, with subsequent cracking — the most difficult problem in connection with concrete — are thus not lessened by the mere omission of part of the cement. The engineer has not yet found the secret of designing the void spaces to fit the gel-producing power of the cement.

Concrete, of course, has long been the subject of research, but most of the investigation to date has consisted of cut-and-try experiments. Different gradations, sizes, and types of aggregates have been tried. Cements of differing fineness and composition have been used. Different amounts of water, different exposure conditions and ages, and different (Concluded on page 258)

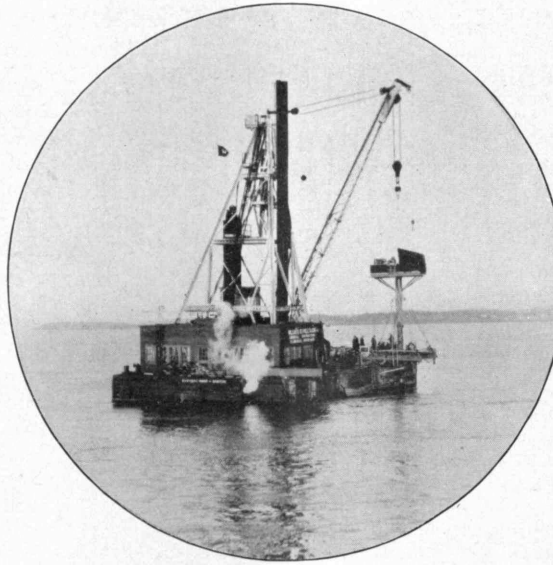


FIG. 1

DEEP-WATER DRILLING

Economics aside, the late 'Quoddy project as an engineering job stirred and still stirs the imaginations of engineers. Below is described a hitherto unreported part of the Army Engineers' exhaustive study of the project, and, shown at the left—to begin at the beginning—is one of the derrick boats from which the ocean floor was drilled—a major engineering job—to bring up undisturbed samples of the bottom for study

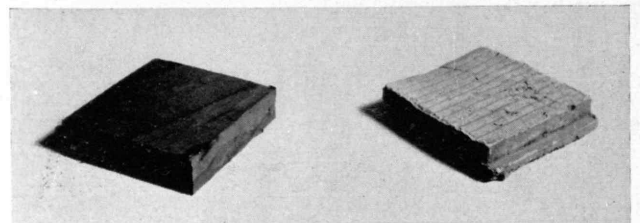
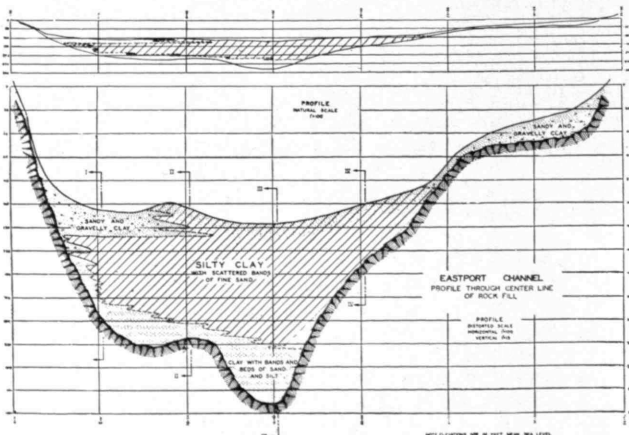
Soil Science

Dirt as an Engineering Material and How Soil Mechanics Is Used in Planning Dams

BY B. K. HOUGH, JR.

IN THE past few years an increasing amount of interest has been displayed by engineers in general in a new branch of civil engineering known as soil mechanics. Since soil mechanics may be considered simply as a new name for foundation engineering or earthwork engineering, both of which are old fields of endeavor, it is not immediately apparent why any cause for special consideration of this subject should now exist. That it has attracted attention, however, is indicated in a variety of ways, such as the appearance of numerous technical papers on this subject, the introduction of soil mechanics as a new course of study by several leading engineering schools, and, particularly, by the establishment by the government of soils laboratories in connection with its flood control and power projects.

Soil mechanics is not just a new name for foundation engineering: It represents, on the contrary, a new conception of this type of work, as a result of which such old problems as the determination of safe bearing values for soil or the degree of stability of earth dams are being analyzed by newly developed methods. In building construction, for example, established practice in foundation design has grown partly from comparative observations on the action of previously constructed buildings. This amounts essentially to concluding that a proposed structure may be erected safely on a given type of soil if an existing building, founded on the same type of soil, is shown to have behaved satisfactorily since its construction. In many instances this seemingly logical procedure has been used successfully, but in



FIGS. 2 AND 3

Place a heavy load, such as a dam, on a foundation of earth, and the earth tends to flow out from under it—in other words to fail in shear. It was important, therefore, to test the 'Quoddy samples for shearing strength, and above is such a sample before and after this test, the right view showing the sample after failure. The drilling operations shown at the top of the page provided samples which revealed channel formations such as that shown at the left

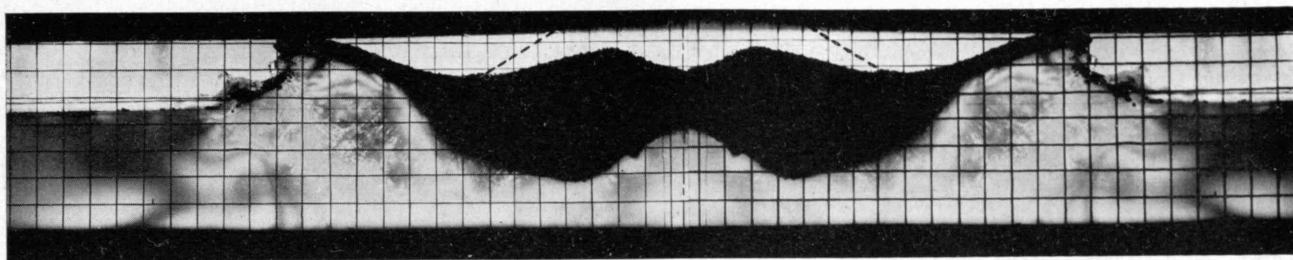


FIG. 6

This photograph, taken through the analyzer included in the drawing of the polarimeter set-up below, shows what happened to a gelatin model foundation when overstressed. Note how the settlement contour resembles an inverted heart

others the completed structures were found to behave in unexpected fashion, sometimes with rather serious results. These exceptional cases are now felt to be evidences of a fallacy in the older methods, and they have given impetus to the development of new theories by means of which each problem might be studied independently.

Many engineers have made notable contributions to this new branch of engineering, but in this country few are as well known as Dr. Karl von Terzaghi, who from 1925 to 1929 was a member of the M.I.T. Faculty. To many American engineers he stands as the founder of soil mechanics. The methods which have been built around his work follow the practice of structural engineering, in which specimens of the various materials of construction are subjected to tests for the determination of such characteristics as their unit compressive or shearing strength, so that final design may be based on knowledge of the action of such materials when stressed.

This procedure is carried out in foundation work by conducting a subsurface exploration at a proposed site to discover the nature and extent of the existing soil and rock formations, and to obtain representative samples or specimens of these materials for study and test in a soils laboratory. Following such testing, computation is made of the stresses which the proposed structure will create in the soil, and a comparison is made between these stresses and the strength of the soil as determined by test, so that overstress of the foundation at any point may be avoided. In the process of making many such analyses, it has been discovered that the fallacy previously mentioned in the older methods is due in part to the

assumption that observations made on the action of one type of soil may be utilized directly with another soil type which is superficially similar. It may be true that "pigs is pigs," but in soils the varieties existing in apparently ordinary dirt are almost infinite. Even where two soil formations are found to have identical characteristics, their behavior under load is now believed to be affected by the nature of the load and by the soil boundary conditions.

One illustration of the type of work being conducted in the field of soil mechanics may be found in the following account of the activities of the soils laboratory established at Eastport, Maine, for the now discontinued Passamaquoddy tidal power project. In the process of "harnessing the tides," one step was the construction of a number of large earth and rock-fill dams. The natural conditions at the site of the two largest dams were very unusual and required very intensive study, as may be seen from the following description. These dams, which were known as the Eastport and Lubec dams, were intended to close the two tidal passages of the same names which serve as the principal connection between Cobscook Bay and the ocean. In these channels the maximum depth of water at average tide exceeds 100 feet, the tidal range is sometimes as great as 26 feet, and currents reach velocities as high as six feet per second. The channel bottoms consist generally of a marine clay of considerable depth. In some instances bed rock is found at an elevation of -275 feet referred to mean sea level.

Following the previously indicated procedure, the first step in attacking the problem of designing a dam which would be structurally stable in such conditions

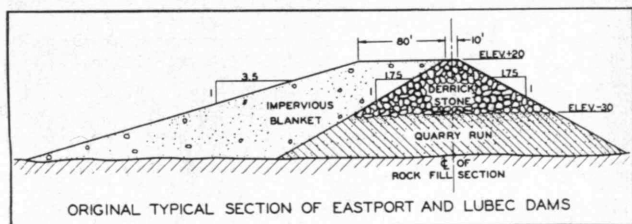


FIG. 4

In the soil mechanics laboratory, tests were made which predicted what would happen if dams of the above design were attempted in the Eastport and Lubec channels. The illustration at the top of the page shows what would tend to happen to a model dam constructed according to this plan

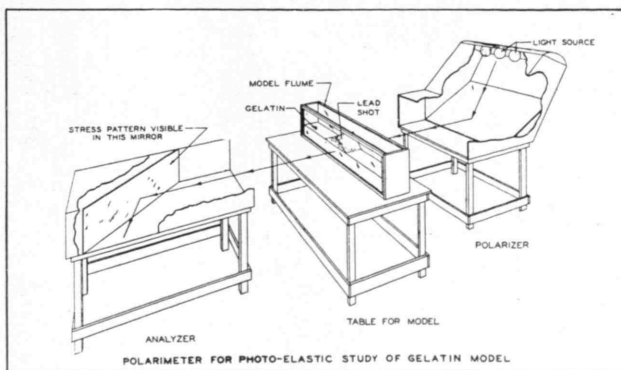


FIG. 5

Polariscope for photoelastic study of gelatin model

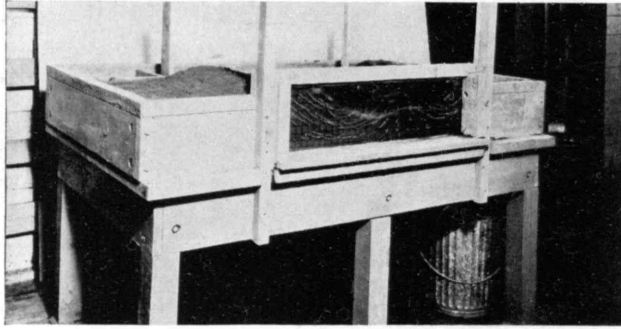


FIG. 7

In this model a bed of clay rather than of gelatin was used in studying the settlement characteristics of the Quoddy dams

was to obtain samples of the clay foundation material for test in the laboratory. In itself, this detail of the work constituted a major operation. Drilling was conducted from two large derrick boats, one anchored in each channel. To protect the six-inch drill casing from the lateral force of the tidal currents and to provide a stable support for the drill platform, an extra heavy 21½-inch casing or spud was first erected in sections over the sides of these boats. All guys to the spud and all anchor lines to the barge were led to hand winches, constantly attended so that the spud could be kept vertical and the position of the barge maintained at all times despite the rise and fall of the floating plant with the tide. After erection of the spud, drilling was conducted in normal fashion inside it. Fig. 1 shows the barge, *Eastern Chief*, in actual operation. In this way a large number of representative, undisturbed samples of the material at the damsites was obtained. The extent and general character of the formations in the Eastport Channel, as disclosed by examination of these samples, are shown in Fig. 3.

Tests on these samples were then performed in the soils laboratory by methods which in general principle are similar to the tests conducted in a testing materials laboratory. Of these, the shear test is considered one of the most important. Fig. 2 shows a clay sample before and after such a test and illustrates the type of failure induced in the specimen. The importance of this test in earth-dam design is due to the belief that the failure and rather rapid subsidence sometimes occurring in dams and highway fills is not due to compression of the foundation material but results from a lateral flow or movement of this material as it squeezes out bodily from beneath the structure which has overstressed it and caused it to fail in shear.

With complete test data available for a given site, a foundation analysis may be made for any proposed structure. At Eastport the design adopted for preliminary study and investigation was as shown in Fig. 4.

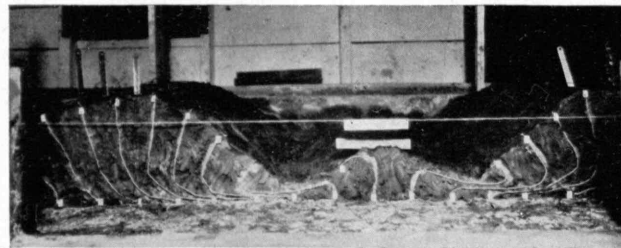


FIG. 8

The white lines imbedded in the clay were in a vertical position before the clay was loaded. Their position in the picture clearly shows the direction of the deformation. Here again the profile has the same heart shape shown by the gelatin in Fig. 6

The general plan for construction was to build the rock-fill section of these dams first as a separate operation to effect closure of the channels, and after this step, to seal the dams with an impervious soil blanket placed on the upstream face. The primary thing required of the laboratory, therefore, was an estimate on the relative stability of the rock-fill section alone.

The first analysis made was carried out by rather approximate analytical methods but served, nevertheless, to show quite plainly that the proposed rock-fill sections would not be stable by a considerable margin. To put it somewhat more technically, it was found that the induced shearing stresses in the underground material considerably exceeded the shearing strength of this material as previously determined by test and that, as a result, severe settlement of the structures might be expected if the original plan were followed. This finding made necessary the preparation of an alternate design which would have a satisfactory factor of safety against failure. About the only feasible change from the original design was to increase the base width of the unstable section, thus distributing the load over a greater area and reducing the excessive shearing stresses. When such a design was worked out, it was found that the base

width required for stability was from five to ten times that of the original rock-fill section. The additional yardage which would be needed to construct this alternate section was, however, so considerable that the question at once arose as to the relative expense of building the original section and letting it settle, and of building the alternate stable section with its flatter side slopes. The answer to

this question lay, of course, in a determination of just how much the original section would settle.

In the process of investigating this problem it was found that very little information was available on this type of analysis since, in previous practice, dams have in general been built on more suitable foundations where conditions made it economically possible to design sections which would be initially (Continued on page 253)

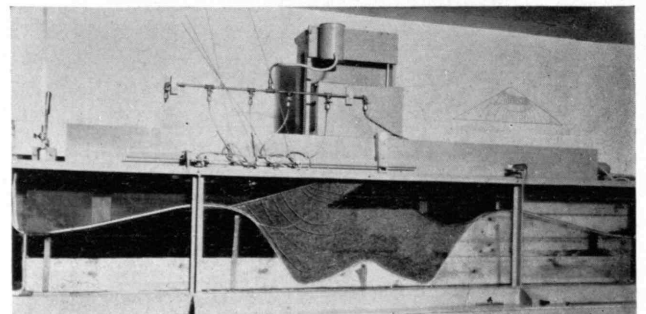


FIG. 9

Seepage studies on model dam with indicated settlement and impervious blanket

Science and the State

The Laboratory vs. Political Isms

BY FREDERICK G. FASSETT, JR.

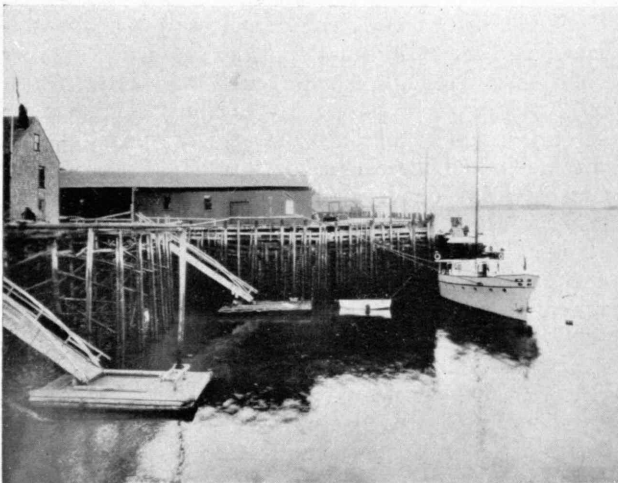
WHEN it damns "technological unemployment" as a likely source of revolution, the popular mind, making science the scapegoat for a lack of jobs, is putting in latter-day terms the feeling which mill workers in England a century ago were expressing in "anti-machine" riots. The prosecution's case in the Scopes trial at Dayton, Tenn., a few years ago was, similarly, a restatement, in rather emasculated terminology, of religious emotions of long standing. It is easy to dismiss such examples of popular antagonism to science by tracing them to worry over taxes for unemployment relief or to irrational prejudice. But to do so is dangerously superficial, for at bottom an attack upon science, however popular its expression, however trivial its guise, however stupidly intemperate its accusations, springs from greater causes.

The history of Western culture is essentially the story of a process of trial and error in which man, seeking greater and greater civilization, has by turns utilized two concepts or ideals as means to that end: It is essentially the story of successive swings from the ideal of the state to the ideal of God as the focal point, the nucleus, about which the "good life" is to be built. Both these ideals—to the nonscientific mind—are anthropomorphic complexes. The God ideal is center of a system of beliefs about man and his relation to a man-God. The state ideal is center of a system of tenets and mechanisms dealing with man and his relation to men. In the practical sense, both ideals work for the convenience of man, to allay his inward doubts with an anthropomorphic and consolatory answer to the question of death, to meet his outward needs through a job, police

protection, suitably temperate amusement, and perpetual care for his graveyard lot. It should be said in passing, though, that anthropocentrism of this sort need not produce a state devoted to the exaltation of the individual, as appears from current European experiments, in which a state created not in the image of man but of the man on the horse—a sort of centauiromorphism—is the end apparently sought.

But there is very little of the anthropomorphic about science. In the fundamental sense, it is an entity apart from, and very difficult of assimilation to, either of the two major philosophical nuclei. It is, in the abstract, amenable or responsible to neither the ethical code of religion nor the pragmatic compromises of legislation. True, in that science is a continuous revelation of order and plan; it agrees entirely with the philosophic view of a religious and hence ordered universe. But in its presentation of the physical phase of that universe, it may readily be found in disagreement with other aspects of religion. Beyond this, science is the intellectual embodiment—again to the nonscientific mind—of the grim and perilous outside world, the wild, the dark, which terrified the cave men and which still lurks in the subconscious of the race, grim and boding.

The underlying repulsion between science and either of the ideals, of course, finds expression primarily through the clashes of institutions representing them. Thus both the Dayton trial and some forms of industrial sabotage are seen to be outward and human manifestations of an inward and abstract condition. The ideal of God and the ideal of the state, both cherished for reasons of practical comfort, both breed conservatism



OUT



IN

Here is photographic evidence of the extent of the tidal range at Eastport, Maine (see preceding article)

and produce systems. Among some peoples, a working compromise has been effected between the conventions so derived. Among others, the institutions of the one have been from time to time rigorously, often savagely, laid waste to make way for the institutions of the other. In Mexico, and now in Spain, churches are sacked by protagonists of new state systems. In Russia, theological ritual is proscribed. In England, an anachronistic attitude toward divorce, which we may call a warped offshoot of the God ideal, drives Edward VIII from the throne.

From the point of view of such vested interests as either of these ideals produces, however, science is essentially Bolshevik. It puts under question the rationality of many of the comforting theories of the God ideal, which we use eagerly to quiet the questioning inward spirit so that we may be free to spend our energies laying up treasures on earth. It is made the basis for unscientific interference with the stability and the even routine of economic and social systems engendered by the state ideal. The profundity of these interferences need not be argued; it is well attested in the compromises that have been inescapable even in the one modern state which has undertaken to embrace without equivocation science and the scientific way — Russia. The most conspicuous of these is the cancellation of the recent congress on genetics at which it was feared Nazi racial theories might be expounded.

Examples from history are plentiful. In Greece, science as such was not a major intellectual concern, but the man who best exemplifies it in his insistence upon definition, in his questioning attitude, was put to death for offense against the state. Socrates drank the hemlock not because there was anything wrong with science as it appeared in him, but because, calling in question the vested interests associated with the dominant ideal, he was a convenient exemplar of an allegedly antisocial force. At other times, when institutions associated with the God ideal have been dominant, science has been viewed as anti-Christ, and its followers, as witness Galileo, have been forced to recantation. As the oscillations of a pendulum are more readily estimated by reference to a fixed point, so the ideal to which men's minds have swung at a given time may be determined by the current type of antagonism to science. In our time, in those nations consecrated to apotheosis of the state, science has occasionally had its earlier persecutor as an unexpected fellow victim on the rack, as when *Der Fuehrer* assimilates both God and science to Aryanism by Teutonizing the Deity and purging from the canon of scientific knowledge all elements introduced into it by Jews.

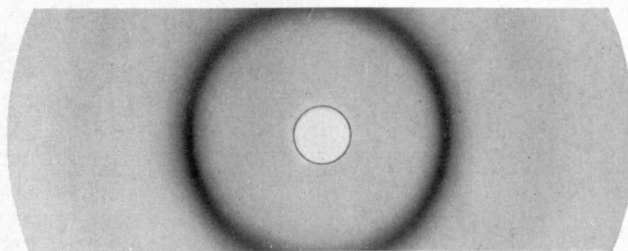
The conclusion is plain that in the present, as far as non-Catholic Christianity is concerned, the dominant ideal is not God but the state; science is anti-demos. Men are concerned less with their relation to God and more with their relation to themselves, to other men, to the immediate complex of environment, to getting a living and some present content. Whether this is a necessarily more or less sterile ideal than the other need not concern us. Ralph Adams Cram would probably denounce it. Many of the Humanists of a few years ago would probably exalt it. The shift of emphasis is illus-

trated in the fact that the official phase of Christianity which many regard as the principal "going concern" in the service of the God ideal finds modern science, with all its questioning of bases, assimilable and reconcilable. The Pontifical Academy of Science which Pope Pius recently instituted is a sign of the times; the declarations of the *motu proprio* establishing it are indexes of the thought of the times: "The Council of the Vatican has solemnly asserted that science and faith are not in conflict, but that they render each other mutual assistance. It is true that in recent times, above all in the last century, it has been erroneously affirmed that between science and divine revelation there was conflict. . . . But today there are very few among the followers of the positive sciences who persist in this error." The Council's solemn assertion, which finds more eloquent response in the well-popularized protestations of many modern physicists concerning the existence of deity, is, notably, made at a time when papal sway in Europe is at a very low ebb, when Britishers cry "Down with the Bishops!", when the Papal Secretary of State hastens on an undefined mission to the New World — last stronghold of Catholicism. An earlier great gesture of Rome toward science — Clement IV's aid and countenance to Friar Bacon — occurred at a somewhat similar moment when, past its peak of greatest power, the Papacy was declining because men's minds were becoming engrossed with the then new ideal of the national state.

This *rapprochement* of church and laboratory, if our theory hold, should be balanced by an opposite situation between senate house and laboratory. In good measure, it is. In Germany and Russia, where the democratic observer sees the state ideal gone too far, science is called in question, as a matter of emotional demagoguery in the one, of shrewd pragmatism in the other. In England and France, where the more temperate form of statism continues, no overt move (if we except the Bishop of Ripon's ill-fated suggestion, some years ago, that science take a holiday) has yet been made. What may be expected there one day may be surmised from conditions in the United States, where also the state ideal is still within bounds, even though Maine and Vermont appear not to believe so.

In this country, the most conspicuous official manifestation of an attitude of question, if not of deeper feeling, toward science, is to be found in the letter which President Roosevelt, in the midst of a busy campaign for reelection, found time to address to the presidents of scientific and engineering schools, urging them to place more attention on developing the social awareness of their students. With the substance and tone of the message there cannot be much quarrel; it made few assertions and posed no tasks with which a sensible man could disagree. That the spirit it showed was not entirely in keeping with previous administrative policy detracts from its effectiveness but not from its significance. For, considered apart from its immediate purposes and regarded as an unconscious official cognizance of an irrational popular feeling, the President's missive is another precipitate of a strange solution of fallacies — the popular mind.

(Continued on page 248)



AN X-RAY PORTRAIT
... of liquid sodium looks like this

The Solid Matter Mystery

Or Why Is a Glass?

BY PHILIP M. MORSE

SOMEHOW it is the simplest questions which are the hardest to answer. In spite of the funny mathematics, individual atoms are fairly comprehensible fellows. If Niels Bohr is right, atomic nuclei are nothing but smallish raindrops which can be understood without much trouble. The really tough problem is to determine the structure of ordinary everyday things like steel and glass and shoe leather. Technology is one of the places where people are tackling these commonplace mysteries: trying to find out why some solids make good girders and others make good abrasives, why some can be spun into ropes and others can be used for elastic bands, why some always solidify as crystals and why a few others prefer to form a glass with an amorphous structure and no definite melting point.

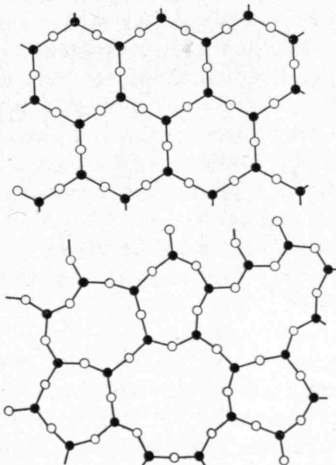
All these mysteries are just different portions of the problem of the structure of solids, of how the atoms or molecules of a substance link themselves together in

CHEMISTS CREATED A NEW WORLD WHEN THEY LEARNED TO MANIPULATE THE STRUCTURE OF THE ORGANIC MOLECULE. WILL PHYSICISTS BRING ANOTHER REVOLUTION BY MASTERING THE STRUCTURE OF SOLIDS?

a settled community to achieve stability. Part of the problem is mechanical: to determine the strength and stiffness of the bonds knitting together the lump of matter. Part of it is dynamical: to determine how much freedom each atom has for temperature vibration, and how much of this motion the structure

can stand before it crumbles into that anarchy called the liquid state. But a large part of the problem is simply a geometrical one: to determine the equilibrium positions of the various atoms in the stable structure. The solving of this part is the first step in the solution of the whole mystery; only after we know the geometrical structure of the solid can we begin to study the reasons for its strength and its fusibility.

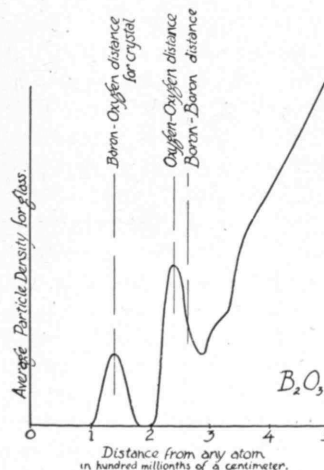
For a long time this problem of structure has been left to the chemist because he was the only person willing to do something about it. Actually the methods of chemistry are not very well fitted for a study of the structure of solids. The first thing a chemist does with



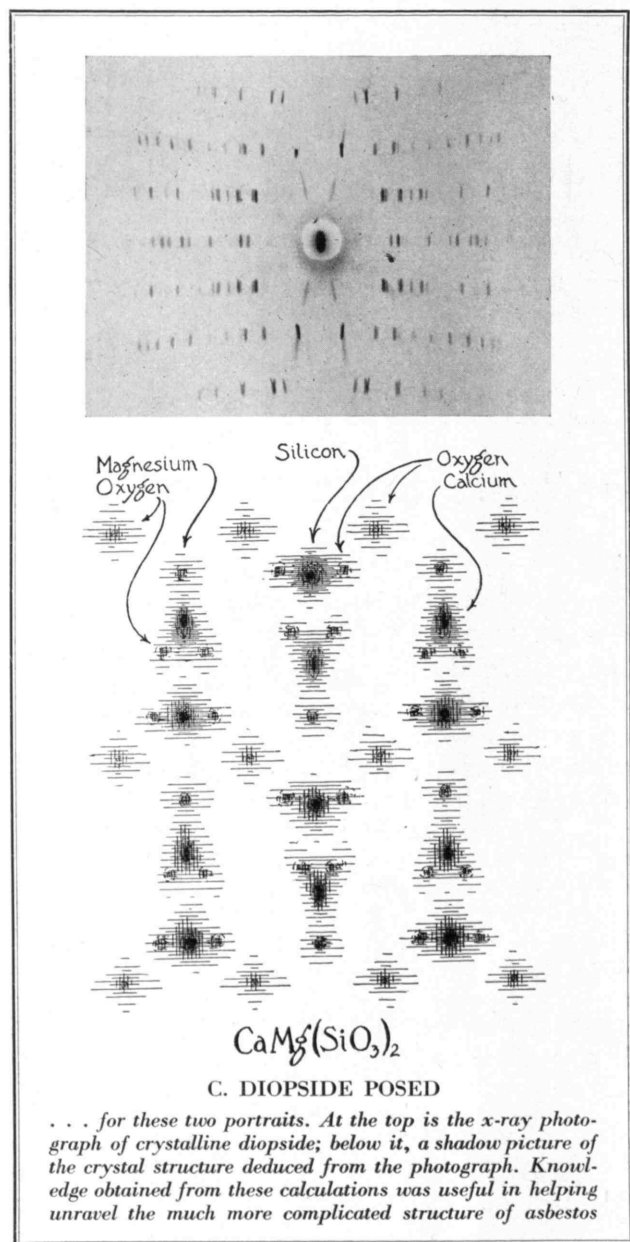
ATOM POLITICS

To understand a solid it is necessary to know how many close neighbors each atom has and how the neighborhood is arranged. Here are two atomic town plans drawn from data obtained by that master surveyor, the x-ray. At the left the upper pattern with its regular hexagons may be said to represent the atom neighborhood while it votes solidly Republican — in other words, crystalline B_2O_3 . In the irregular lower pattern the neighborhood has gone Democratic — in other words, turned into glass.

The curve at the right might be labeled "Neighborhood Intensity"; it gives the average number of atoms surrounding any atom, at various distances away from that atom, for B_2O_3 glass



Drawings based on data by Warren, Krutter, and Morningstar



Photograph and calculations by Bragg and Warren

a substance he is to study is to destroy its solid state, to dissolve it or melt it or evaporate it. His way of studying solid structure is thus very indirect indeed. What is needed is a method which can study the substance while it is solid. In the study of solids the chemist has been handicapped even by his point of view. He is prone to think of material in terms of molecular units, of silica being SiO_2 even in the solid state. The formula itself induces him to picture two oxygen atoms and a silicon clinging together in a family group even in the crystal, keeping closer to each other than to any other group. Actually, solid silica can be written $\text{Si}_{10}\text{O}_{20}$ or $\text{Si}_{123}\text{O}_{246}$ just as well as SiO_2 . One interatomic bond is exactly as strong as any other. Each oxygen atom is bound to two silicon atoms, and each silicon impartially distributes its holds among four oxygens. Of course there are crystals in which the molecule retains its identity; sulphur has its atoms collected into tough, doughnut-shaped groups

of eight, whose holds on other doughnuts are much weaker than are the bonds inside the group. On the other hand, all the bonds in a diamond crystal are equal, each carbon clinging to four others; and strictly speaking, the diamond molecule is the whole crystal. A chemical formula for a solid tells us only the relative proportions of the different kinds of atoms present. It is much more important to know how many close neighbors each atom has and how they are arranged. Physical methods, not chemical ones, are needed to answer these questions.

In the last score of years the physicist has been developing the technique and the theory with which to attack the problem of solid structure. Much has already been done, but much still needs to be done. Technology, with Professor Bertram E. Warren, '24 and his group using x-rays, Professor Hans Mueller using optical and electrical means, Professors John C. Slater and Nathaniel H. Frank, '23, working on the theoretical aspects, and Professor Martin J. Buerger, '24 applying the work to mineralogy, is one of the outstanding centers in this country for work of this kind. Even the physicist has had to use somewhat indirect methods to determine solid structure. Unfortunately atoms are far too small to see, even with the aid of a microscope; the usual interatomic distances are about a thousandth of the wavelength of visible light. Even though x-rays have wavelengths as small as these distances, one cannot hope to obtain an actual picture of the structure either by lenses or by shadow pictures. The solution must be obtained by more roundabout methods.

X-rays are electromagnetic waves, regular, periodic things; and this regularity makes them sensitive to any regularity in the material they traverse. When these rays pass through a single crystal, in addition to the undeflected beam, other beams emerge at various angles and with various intensities. Each beam corresponds to some interatomic distance which is regularly repeated in the crystal; its angle depends on the ratio of this distance to the x-ray wavelength and on the angles between the direction of the beam and the crystal axes. The intensity depends on the number of electrons in the crystal atoms and on their distribution. For instance, among the beams scattered from a piece of rock salt, there will be a set corresponding to the distance between a sodium atom and the nearest chlorine atoms, another set for the distance to the nearest sodium atoms, another for the distance to next nearest chlorines, and so on. If one photographs all these beams, measures their angles and intensities, a series of formulas makes it possible to construct a silhouette of the crystal structure. The structures of a large number of crystals have been worked out by this method. Once in a while a specimen is encountered which is too complicated to unravel from the computed shadow pictures, and the physicist must then use other means to help him solve the problem. But that is another story.

However, few solids are made up of single crystals; they are usually conglomerates of many small crystals packed together in complete confusion. Even in such cases the x-ray pattern can tell us something of the structure of the constituent crystals, though it cannot tell us so much as can the pattern for a single crystal. The beams for polycrystalline matter run together to

form a sequence of rings surrounding the primary beam. Although no silhouette can be computed, the size and intensity of the various rings can tell us the sizes and frequency of occurrence of the various interatomic distances, and the width of the rings can tell us the average size of the crystals in the material. From these data it is often possible to deduce the structure.

So much for the technique of working out the structure of crystalline and polycrystalline materials. Its reduction to routine engineering practice has been more or less completed by now. Many substances have not yet been analyzed, but very little of the work to be done involves breaking new ground.

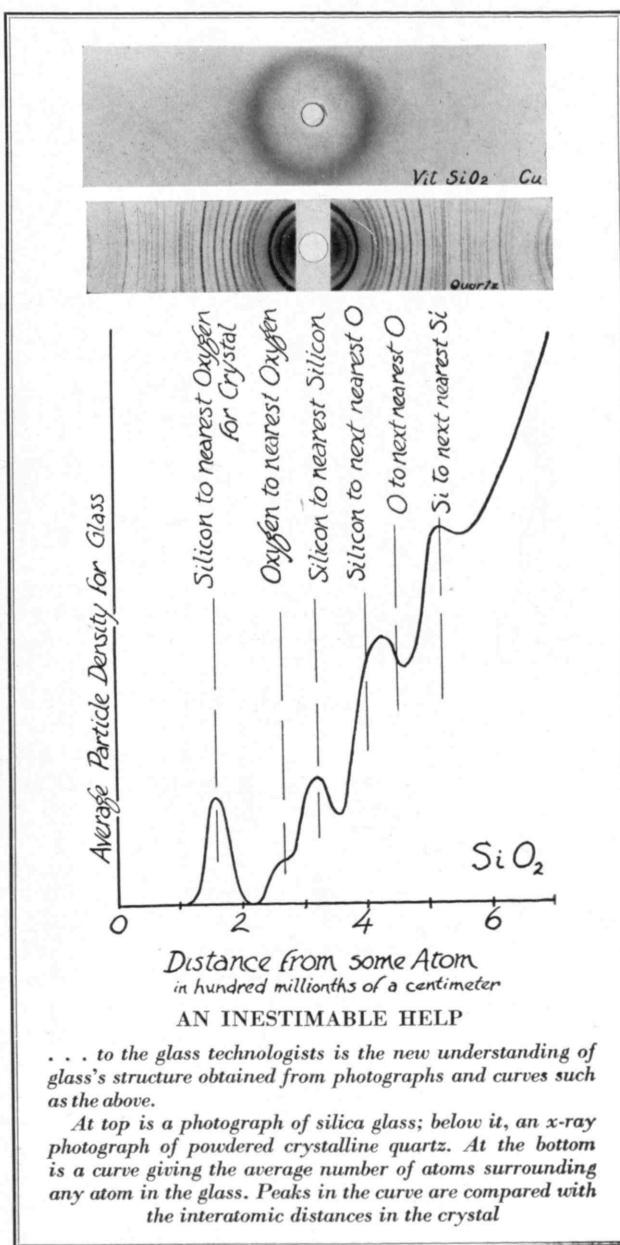
The new ground being broken is in the study of amorphous matter—glasses and liquids. Professor Warren of Technology is one of the authorities on this subject. His group have been busy for several years turning x-ray photographs of these noncrystalline materials into structure models, and their findings are of great interest for the chemist and the engineer. At first sight it would appear that x-rays could tell us very little about the structure of amorphous materials. Here there is none of the symmetry and regularity one meets in a crystal. However, there is one regularity remaining: The distance from an atom to its nearest neighbor is about the same throughout the material. There may be differences in the number of atoms surrounding a given atom; there may be no uniformity in the directions of the lines joining two neighbors. Nevertheless, the neighbors are all about the same distance apart. For instance, if we plot for liquid sodium the average number of atoms at various distances from any particular sodium atom, we will find that no atoms come closer than a certain distance—the atomic diameter. Just outside this limit there is a sudden peak in the average number curve, corresponding to the eight or more neighbors which are squeezed as close as they can come to the one which is taken as a center. Beyond this the curve has a drop and then another less marked peak, corresponding to the next neighbors. Beyond this all regularity is lost, and there are no more peaks or dips in the average number curve.

The x-ray photographs of amorphous material show a few broad, fuzzy circles. By graphical and mathematical methods these can be changed into a curve of average number, giving the average density of atoms around any given atom. These curves show just the form described above, first following along the zero line, then having one sharp peak, a valley, and a broad peak, after which the curve is smooth. The area under the first peak shows how many atoms, on the average, are surrounding any given atom, an important quantity for the study of liquids.

The technique for the study of glasses is much the same. Here there are usually more than two peaks in the computed density curve before it smooths out. A study of these curves, together with a knowledge of the structure of the crystal of the same material, leads to a picture of the glassy structure.

A glass is a clumsy caricature of a crystal, like a child's crude copy, distorted and with parts left out here and there. The left-hand drawings on page 237 show a schematic representation of the probable crystalline

form of B_2O_3 and the corresponding glass. The black dots represent the boron atoms; the circles, the oxygens. In the crystal everything is beautifully regular; each oxygen clings to two borons, and the whole structure forms a sequence of hexagons, 12 atoms to each ring. In the glass the atoms and the bonds are all there, but the pattern has gone awry. Each boron atom spreads its three bonds symmetrically out to three oxygens, but the oxygen bonds sometimes are flexed, allowing a general irregularity. No longer does each ring have just 12 atoms, nor do the rings form hexagons. Nevertheless, there is some regularity. In fact, if a boron atom could not see beyond its nearest oxygen neighbors, it could not tell whether it were inside a crystal or a glass. If it looked beyond to the next borons, it could tell, in a glass, that some of the oxygen bonds had bent a bit. But even out this far there would be no great irregularity. Only far away (Concluded on page 255)



Curve calculated by Warren, Krutter, and Moringsta

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

Tuition in 1938

TO assure Technology's continued leadership in scientific, engineering, and architectural education, the Corporation at its meeting on March 10 voted to increase the Institute's tuition in the autumn of 1938 from \$500 a year to \$600. Coincidentally, substantial additions will be made to funds for scholarships and fellowships, thus removing any barriers to obtaining the advantages of a Technology education for students of high promise but limited means.

The Corporation's decision was prompted by the uncertainties of future incomes from gifts and endowment, as well as the prospect of rising prices. Nor was this step taken without consideration of many other factors, including a study of tuition in American colleges. Although the Institute's expenses, particularly for extensive laboratory operation, are inherently higher per student than many other institutions, its present tuition, which includes all the charges usually considered as extra undergraduate fees and taxes, is still slightly lower than the combined tuition and extra fees of several institutions whose operating expenses are considerably lower.

Opportunities for students of exceptional ability but limited financial resources to enter the Institute were enhanced by the Corporation's provision for a large increase in scholarship funds for the Undergraduate and Graduate Schools, supplemented by additional assistance from the Technology Loan Fund. Since its establishment in 1930, this fund has benefited 1,500 students, and the excellent record of repayment has made it completely revolving several years earlier than was expected. The present average cost per student for a year's education at Technology is slightly more than \$1,000, and the tuition is \$500. Of the total cost, approximately \$700 goes into direct academic expenses, such as teachers' salaries, library, and laboratory instruction. The remaining 30% represents the cost of administration, maintenance of grounds and buildings, and special research of great value to teacher and student alike.

President Compton announced the Corporation's action at the regular meeting of the Faculty on March 17. He spoke then of the Administration's determination to adhere to the ideal of continually maintaining Technology in a position of leadership in science, engineering, and architecture. Furthermore, he emphasized the singular significance of this ideal in view of trends under which the financial burden of higher education seems destined to be more and more assumed by governmental agencies.

It is President Compton's conviction that it is becoming increasingly important for a certain number of private and independent educational institutions to maintain positions of unquestioned leadership in

education. Thus may the entire program of higher education in America retain and extend its ideals and the search for truth, untrammelled either by political opinions or by tendencies to lower the highest standards of education to the average measure that might otherwise be imposed by mass opinion.

Graduate Executives

A PIONEERING program of education for high executive positions in American industry will be offered to a selected group of young businessmen under a plan of honorary sponsored fellowships in business and engineering administration, which will start in June. This interesting system of post-industrial education, announced by President Compton at the meeting of the Corporation on March 10, is the outgrowth of a very successful experimental program of advanced training for executive responsibility started at Technology five years ago. The plan will be operated under a system of fellowships sponsored by 35 distinguished business and industrial executives.

Beginning in June, 15 potential young executives on leave of absence from their companies will begin a 12 months' intensive program of study, consisting of a summer session and year of graduate education. The selection is now being made from a large group of technically trained young men in business and industry, and the fellowships will be awarded, by invitation only, to men of exceptional executive promise, intellectual capacity, and physical resource. These will come from the more mature group of younger executives who have had several years of industrial experience.

Establishment of the program is made possible by an anonymous gift of \$25,000, providing for scholarship stipends of \$1,450 for single men and \$1,950 for married students. The course will lead to the degree of master of science in business and engineering administration. In making the announcement, Dr. Compton explained that under the plan of sponsored fellowships the young business executive will be given the same type of advantageous experience as that gained by the young doctor or young lawyer in his period of internship or apprenticeship under the guidance of the most distinguished men in his profession. Hitherto the young businessman has not had this advantage, since he usually comes in contact only with minor executives in the early years of his career. The new plan provides abundant opportunity for contact with a diversified group of the most successful executives in America and discussion with them of their problems, principles, and methods.

"The experience of the small group of honorary fellows during our experimental program of the past five years," Dr. Compton said, "and their record of success following their fellowship year is convincing evidence

of the soundness of this step in administrative education. The plan recognizes the fundamental value of specialized knowledge of industrial economics, sociology, management, and labor relations, and the relationship between business and government — all of which are now, more than ever, of primary importance to American industry. Training in these fields, therefore, is a preparation for intelligent administration of existing industries and for those industries which technical progress is certain to create in the future.

"The importance of advanced education for leadership in business is indicated by a recent survey reported to the Society for the Promotion of Engineering Education, which showed that out of 15,084 college-educated officers of American industry, including presidents, treasurers, and executives in engineering, sales, and production, 12,225 were graduates of engineering and scientific institutions, and 2,859 from all other types of colleges. Of the 235 college-trained presidents in American industry, 151 were educated in technical colleges and 84 in other educational institutions."

The new program of administrative training will be under the direction of Professor Erwin H. Schell, '12, Head of the Department of Business and Engineering Administration, who has been in charge of the five-year experimental plan, aided by a distinguished advisory committee, all members of which have had wide experience in fellowship administration or the development and training of young men. Former President A. Lawrence Lowell of Harvard University, who is a member of the Institute's Corporation and who, while at Harvard, organized the plan of the university's junior and senior fellows, is a member of this committee; President Compton, who has served many years on the National Research Fellowship Board, is also a member; and President Frank Aydelotte of Swarthmore College, a former member of the staff and now chairman of the committees which administer the Rhodes Scholarship in America and the Guggenheim Fellowships, has consented to serve. The other members are the Rev. C. Leslie Glenn, widely known young rector of Christ Church, Cambridge, and Mr. Edmund C. Mayo, President of the Gorham Manufacturing Company, who has been successful in developing young executives in his own organization.

The faculty will include outstanding authorities in the various fields to be covered, and business executives will collaborate in special studies. In addition to the Department of Business and Engineering Administration, the honorary fellows will have the advantages of the entire resources of the Institute in the development of their courses.

The summer-session program will include courses in production, marketing, finance, accounting, business law, and industrial relations. Fields in the subsequent graduate curricula in which subjects may be elected will include current economic problems, principles of sociology, financial administration, government control of industry, international economic relations, investment analysis, labor organization and industry, industrial manufacturing analysis, marketing research, advertising, administrative theory and practice, monetary and banking problems.

The honorary fellows will live together as a special group and part of their training will include administrative seminars, weekly conferences with distinguished business



ELIHU THOMSON (1853-1937)

The Review regrets to report the death of a great man of science and another important figure in Technology history, Elihu Thomson. Holding over 700 patents, he was one of America's greatest inventors. As was remarked at the celebration honoring him on his 80th birthday, held at the Institute in 1933, "more than any man now living . . . Professor Thomson has combined in a most remarkable way the constructive powers of the inventor, the thoroughness and soundness of the man of science, and the kindly balance of the ideal philosopher, teacher, and friend." From 1920 to 1923 he was acting president of the Institute, for many years a member of the Corporation executive committee, and from 1894 to his death, nonresident professor in electrical engineering.

To readers of The Review who desire more information about Professor Thomson, the Editors will be glad to send reprints of "An American Faraday," a biographical article written by President Compton and published in The Review in January, 1931

and industrial administrators, and original research. The unmarried fellows will have quarters in the Institute's Graduate House, with a special dining room and a conference lounge set aside for their weekly dinners and business conferences with industrial executives. Special provisions will be made for housing married students.

Gales for Research

SINCE the construction of its earliest wind tunnel nearly 40 years ago, the Institute has led in aeronautical engineering education, contributing richly, in the meantime, to knowledge through research. That it will continue thus was indicated by President Compton's recent announcement of plans for a new wind tunnel of novel design which will be capable of developing wind velocities up to 400 miles an hour and simulating variations in atmospheric pressure such as are encountered up to altitudes of 35,000 feet. This is the wind tunnel named by Dr. Compton last autumn as one of the important objectives of the Institute's \$12,500,000 expansion program.

In recognition of the pioneering achievements of Orville and the late Wilbur Wright, the new structure will be known as the Wright Brothers Memorial Wind Tunnel. As early as 1900, some three years before their epoch-making flight at Kitty Hawk, N. C., these two investigators began tests on curved wing surfaces in a primitive wind tunnel at Dayton, Ohio.

Details of this advanced tool for aeronautical research have not yet been announced, but its design will be radically different from the Institute's present tunnels. A 2,000-horse power steam turbine, for example, will whirl the huge fan for generating the high wind velocities required for modern airplane research, and the tunnel will be constructed of welded ship steel — much in the manner of a submarine — to meet the unusual requirements of varying air pressure. Ten feet in diameter, the experimental chamber will permit testing of models with wing spans up to eight feet. Control of air pressure will make it possible to test aircraft models or wing sections under flying conditions that would be encountered at substratosphere altitudes or heights of nearly seven miles where barometric pressure is approximately one quarter of that at ground level.

The new wind tunnel has been designed to anticipate the demands of a progressing art, the swift development of which is indicated by the fact that since 1918 aircraft speeds have increased from 100 miles an hour to 300 miles an hour. This latter speed, already reached by small airplanes, may be attained by large transports within ten years, and substratosphere flying may make still faster flying economically possible.

While the exact site of the tunnel has not been chosen, it probably will be built near the present Guggenheim Aeronautical Laboratory. In addition to Institute research, the new tunnel is expected to be of value to the aircraft industry in the solution of its problems of design.

The Institute was a pioneer in aeronautical engineering education. As early as 1896, A. J. Wells, an instructor in the Department of Mechanical Engineering, and

Professor Gaetano Lanza built a three-foot square wind tunnel in which they succeeded in developing an air speed of 20 miles an hour. In this device they conducted research on pressures on plane and curved plates and their objectives were definitely stated to be new knowledge for the design of machines for mechanical flight.

In 1912, F. W. Caldwell, '12, famous as the designer of the variable-pitch propeller, completed a thesis consisting of tests of propellers on a whirling arm, and in the same year Luis deFlores, '11, now a prominent consulting engineer, and A. V. deForest, '11, who is a professor at the Institute, based their thesis on the measurement of propeller thrust in flight of a Burgess-Wright biplane. This was the first time such information had been obtained.

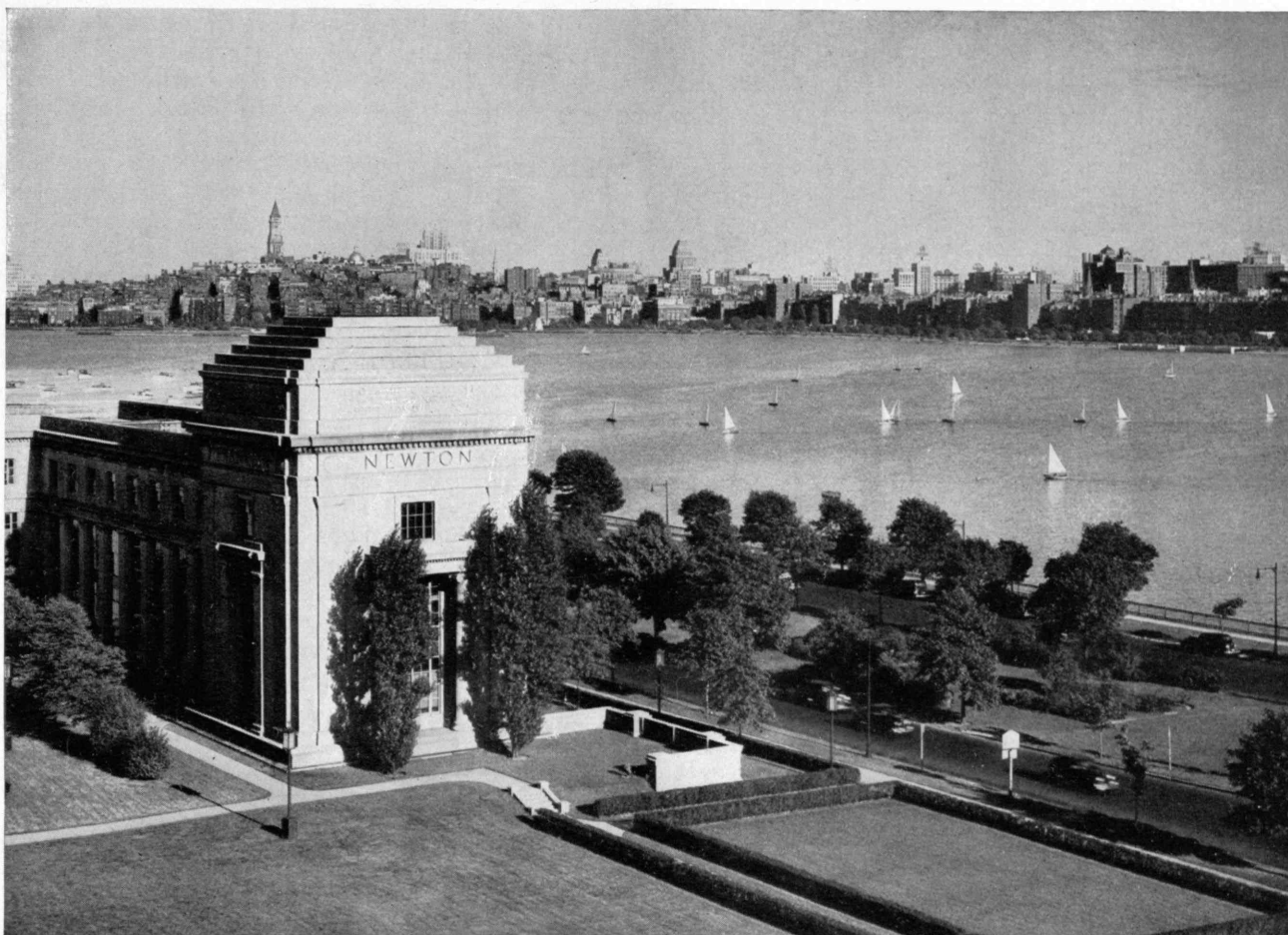
In 1913, Jerome C. Hunsaker, '12, now in charge of mechanical and aeronautical engineering at Technology, was detailed by the Navy Department to develop courses and research in aeronautics at M.I.T. The following year under his direction a wooden tunnel, four feet square, was constructed. In this undertaking Dr. Hunsaker was assisted by Donald W. Douglas, '14, now the leading American airplane builder. It is interesting to note that this tunnel was erected in a shed on the Cambridge site of the present Technology buildings during the course of their construction, and thus became the first academic building of the greater Technology group which was completed in 1916.

In 1922, a seven-and-one-half foot circular-throat tunnel, capable of producing an air speed of 85 miles an hour, was built. Upon completion of the Guggenheim Aeronautical Laboratory, it was moved to that building, the equipment of which now also includes a five-foot tunnel built in 1929 to develop a maximum air speed of 95 miles an hour. Both these tunnels are still in use and have contributed materially to the advancement of aircraft design. A smaller tunnel with an air speed of 150 miles an hour was constructed in 1927 for the study of heat transfer.

Sounding the Atmospheric Ocean

THE first organized study of high-altitude atmospheric conditions over New England by means of sounding balloons has just been completed by meteorologists of the Institute and the Blue Hill Observatory of Harvard University. Nearly every day for more than a month the meteorologists gathered on the roof of the Guggenheim Aeronautical Laboratory in the dank darkness just before dawn to release the balloons, each of which carried a compact weather observatory and automatic radio transmitter, the total weight of which was just one pound. The aim of this joint project was to obtain a complete record of the temperature, humidity, and pressure — of which the last mentioned is used only to determine the height — up to the stratosphere and higher if possible.

Since 1931, when the Institute began daily airplane ascents from East Boston for weather soundings, the conditions of the air to a height of three miles have been recorded whenever the airplane could fly. These weather flights were carried on by Technology until 1935, when the United States Weather Bureau with the aid of the



F. S. Lincoln, '22

ON THE RIVER AGAIN

... are Technology crews (8) and dinghies (40) and here is how the river is dressed, seen from Building 3, come a sunny afternoon

Army took over the work. The airplane ascents have yielded extremely valuable information to the forecaster, but in fog or snowy weather the conditions are too hazardous for flight, and so at times when upper-air information is most urgently needed, it is not available. Further, the airplane cannot attain more than 20,000 feet, yet much weather is manufactured above this.

By the use of radio meteorographs attached to small balloons, however, it is possible to obtain records in weather too dangerous for flying and at twice or more times the height to which the airplane goes. The remarkable instrument which makes all this possible is the product of joint research by Dr. Karl O. Lange, formerly in charge of the Institute's airplane work but now research assistant at Blue Hill Observatory, and Arthur E. Bent, also a research assistant of the observatory. Dr. Lange designed the meteorological portion and Mr. Bent the radio transmitter.

The meteorological instrument consists of a very small barometer, thermometer, and hygrometer, from each of which a silver pointer rests against a small cylinder on which is wound a platinum wire in the form of a helix. This cylinder is rotated by clockwork, and, each time the wire passes under one of the silver pointers, an electric current passes through the radio transmitter, causing it to emit a signal. In addition to the three weather pointers, there is an arm to report the

actual speed of rotation of the cylinder. As each pointer changes its position in response to changes in pressure, temperature, or humidity in the air, the interval of time between one contact with the platinum wire and the next varies. It is this variation in time with respect to the speed of rotation that indicates the changes in the weather elements.

The radio transmitter consists of a two-tube set with small coils adjusted to a frequency of 68 megacycles. The power is supplied by tiny batteries weighing but two to four ounces each, made specially for the purpose. The radio is placed in a small box of balsa wood, half an inch thick, which serves as an effective insulator.

The balloons used in the study were designed by the Dewey and Almy Chemical Company in consultation with the meteorologists. They are made of latex, are nearly four feet in diameter, and will expand to a diameter of 14 feet before breaking. Each balloon weighs about two thirds of a pound, and when inflated to lift two pounds can rise to a height of 100,000 feet. Two ascents from the Blue Hill Observatory have exceeded this height.

The daily records of atmospheric conditions were made available not only to the United States Weather Bureau, but also to the daily class in air-mass analysis and weather forecasting at the Institute and to both Technology and Harvard for research purposes.

Tyler Fund

AS a manifestation of their long and devoted interest in Technology, Professor and Mrs. Harry W. Tyler of Washington, recently made a gift of \$1,000 to be known as the Alice Brown Tyler Fund, the income of which is to be used for the welfare of women students at the Institute.

Professor Tyler, who in 1930 retired as head of the Department of Mathematics, is secretary of the American Association of University Professors. Both he and his wife, the former Alice Brown, were graduated from the Institute in 1884.

New Placement Officer

IN welcoming Nathaniel McL. Sage, '13, as the new head of the Institute's Placement Bureau, we record with regret the departure from the Institute community of John M. Nalle, '20, who has ably carried on the work of the bureau since 1933. Mr. Nalle not only brought the Placement Bureau to a new level of effective service to Alumni and industry; he contributed as well to the extracurricular life of the Institute and helped to enrich its communal activities. He leaves the Institute to take charge of engineering and manufacturing for the Coldwell Lawnmower Company of Newburgh, N. Y.

The new Placement Officer is a native of Fort Davis, Texas, and his wide industrial experience includes executive positions with the Package Paper Company, the Aberthaw Construction Company, and the Raytheon Manufacturing Company, of which he was at one time vice-president in charge of sales. Later he held a similar position with the Morton C. Tuttle Company.

During the War he was superintendent of production control at the Squantum plant of the Bethlehem Shipbuilding Corporation, later becoming superintendent of power construction at the Squantum destroyer plant. The volume production methods applied to destroyer construction at this plant were largely the result of his efforts. Until recently Mr. Sage has been codirector of the Putney School of Putney, Vt.

Academic Appointments

LIEUTENANT Colonel Charles Thomas-Stahle, '22, has been appointed head of the Department of Military Science to succeed Colonel Samuel C. Vestal, whose detail at the Institute ended on March 1. Widely known as an authority on military history and as a member of the Faculty much liked by students and colleagues, Colonel Vestal looks forward to early retirement from the Army to which he has given 40 years of service. He had been head of his department since 1931.

The new Head of the Department of Military Science is attached to the Coast Artillery Corps and returned last autumn from duty in the Philippine Islands. He was graduated from Pennsylvania State College and afterward came to Technology, which granted him the degree of master of science in 1922. He is also a graduate of the Coast Artillery School and the General Staff School of the Army.

Colonel Thomas-Stahle has served a prior detail on Reserve Officers Training Corps duty at Michigan State College and also had a tour of duty as instructor and director of the engineering department of the Coast Artillery School.

The appointment of John T. Rule, '21, as assistant professor of drawing is included among other recent changes in the Institute staff. A native of St. Louis, Mo., Professor Rule was graduated from the Department of Business and Engineering Administration, after which he carried on postgraduate work at Harvard for a year. His industrial experience includes eight years as a consulting engineer in St. Louis, and positions with the Scullin Steel Company and the Curtiss-Wright Aircraft Company. Just previous to joining the Institute Faculty he was a member of the instructing staff of the Taylor School for Boys, St. Louis. In addition to instructing in drawing, he will devote himself to the study of methods of stereoscopic presentation of educational material.

Other recent staff changes include the resignation of Philip T. Smith, instructor in physics for the past four years, who has joined the staff of the Radio Corporation of America, and the following appointments: Sidney Speil, '36, as assistant in ceramics; John T. Burwell, Jr., '34, Seibert Q. Duntley, '33, Stuart T. Martin, Jr., '34, and Gerald L. Tawney as teaching fellows in physics; Rockwell Kent, '3d, as research fellow in physics; Dwight P. Merrill, '35, and Frederick W. Paul, '35, as assistants in physics; Jonathan Biscoe, '31, as research assistant in physics; Sterling Lanier as instructor in English and history; Edward F. Cahoon, '32, and William R. Saylor, '36, as assistants in electrical engineering; Raymond P. Rossman and Lewis Mendelsohn, '35, as research assistants in electrical engineering; Herbert H. Uhlig, '32, as research associate in the Division of Industrial Coöperation; James E. Forbes, '27, Lewis Hess, '29, and Robert W. Lindsay, '35, as research assistants in the Division of Industrial Coöperation; Fred H. Flint, '36, as assistant in aeronautical engineering; Frank J. Mehringer and Ernest K. Dockstader, '35, as assistants in mechanical engineering; Brockway McMillan, '36, and Norman Levinson, '33, as instructors in mathematics; Erich Reissner as assistant in mathematics; Joergen Holmboe as instructor in meteorology; Clifford Frondel and James E. Dorris as teaching fellows in geology; Samuel S. Saslaw, '33, as assistant in mining and metallurgy; and Bernard Vonnegut, '36, as teaching fellow in chemistry.

Foundry Conference

IN a coöperative approach to technical problems encountered in the metal-casting industries, the New England Foundrymen's Association and the American Foundrymen's Association will hold a joint conference at the Institute on April 9 and 10. Morning and afternoon sessions will be held each day, with outstanding leaders in this important phase of industry contributing and exchanging information concerning latest advances of knowledge in this field. Among the topics to be discussed are casting designs for iron, steel, and nonferrous metals, sand molding, the mechanical testing of cast iron, sand-testing technique, and cupola melting.

Members of the conference will also inspect research projects in this field in progress at Technology to correlate further the close relation between laboratory research and industrial application. A conference dinner will be addressed by Dr. Compton and D. M. Avey, Secretary of the American Foundrymen's Association.

Visiting Committee Report

SUCH an important link in the Institute's life as the Library cannot have too much attention bestowed on it. For that reason it is a pleasure for The Review to present the following excerpts from the brief, but illuminating and interesting report recently submitted to the Corporation by the Committee appointed to visit the Library.

LIBRARY*

THE Library is in good health and spirits and expects to improve both during the next year. The provision, by the Institute, of revised illumination, of a ventilating system, and of a special and speedy elevator has given the Central Library the desired light, fresh air, and accessibility. Now that we have enough light to look around, we see more clearly that we need more books. We are planning to get them; we have incited the Alumni Council and a special alumni committee to get under way a Friends of the Library movement.

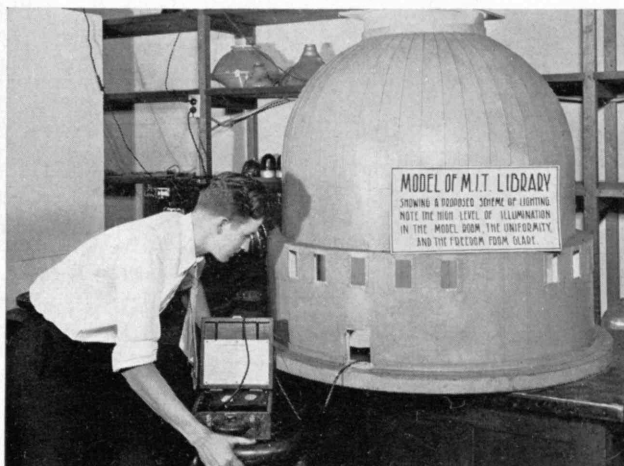
In the interests of the Friends of the Library movement and of other library problems, a meeting of the Committee was held in Boston at the St. Botolph Club on November 4. William N. Seaver, Librarian, attended the meeting, as did Professor Ralph R. Lawrence, '95, representing the Faculty Committee on the Library, and John Ely Burchard, '23, who reported his plan for the Friends. A list of special library needs was furnished to Mr. Burchard and his committee by the Librarian and the Faculty Library Committee. The list includes such items as the reinforcement of the special reference library in the graduate students' dormitories; the building up of the library in mechanical engineering; the noting of special books and journals that should be supplied to various departments; the purchase, or acquisition otherwise, of letters, documents, and manuscripts of famous American engineers.

Mr. Seaver reported to the Committee that during the first months of the current year hundreds of books have been lent to Alumni — an indication, perhaps, not only that they retain literacy with the passing of the years but also that they learn to depend upon the Institute.

The Committee found itself in agreement with Mr. Seaver in his argument that a new library rather than new library quarters should be kept in mind. The eventual plan should be a new building designed specifically for library purposes, rather than a made-over establishment in a building now existing.

Mr. Walton of Harvard's Widener Library, who, with Mr. Milton Lord of the Boston Public Library, is a non-Corporation member of the Committee, submitted

*The members of the Committee for 1936-1937 are: Harlow Shapley, chairman, Walter Humphreys, '97, Frederick W. Garber, '03, Clarence E. Walton, and Milton E. Lord.



MASTERING LIGHT

Increasing interest is being demonstrated in the Institute's Course in Illuminating Engineering with its novel combination of the psychophysiological, technical, and esthetic. Above is a student checking calculated values of illuminance by measurements made on a scale model

a general warning that new techniques and new ideals of the library function are likely to arise in the next ten years. Long-range planning for the Library should keep this possible reorientation in mind. For instance — this is the chairman's suggestion, not Mr. Walton's — some time in the future, with increasing technical knowledge and specialization, the faculty member or the trained engineer may need to consult his specialized librarian as conscientiously, before undertaking a great enterprise, as you would consult your specialized doctor before undertaking explorations, or as an ancient king would consult his astrologer before waging war or matrimony. The future engineer should probably always see his librarian twice a year. The library may develop from a collection of books in which you pursue incidental information to an organization of book-armed specialists who pursue, aggressively, the engineer and provide him with ideas, perspective, and an outline of the documented techniques that may be available for creative labor.

But such comments refer to libraries of the future. The problems of the present Library are well in hand and the outstanding achievement of this year and next is, undoubtedly, the progress that is being made with the Friends of the Library.

“Chemical Who's Who”

AMONG ourselves it often seems as though the Institute were peculiarly outstanding in the field of chemistry, but with becoming modesty we excuse this feeling on the grounds that, because we are closer to M.I.T. graduates, we hear more about them. We add that there is a tendency to pick from a jumble of impressions the ones which are familiar, so we note and remember the honors accruing to our own Alumni. It comes as a pleasing verification, then, to hear from Williams Haynes, editor of the “Chemical Who's Who,” that “the record of M.I.T. graduates in the chemical field ought to be a matter of great pride not only to the

Faculty of the Chemistry Department but to every graduate." This statement was made upon the recent publication of the current roster of 5,686 chemical company executives, prominent chemists and chemical engineers, and professors of chemistry of the leading universities and colleges of the country. Out of this number, 330 men hold M.I.T. degrees, thus taking second place in a list headed by Columbia: Columbia, 349; M.I.T., 330; Yale, 250; Illinois, 249; Cornell, 247; Harvard, 233; Wisconsin, 219; Johns Hopkins, 215; Chicago, 212; Michigan, 206. Seven other universities are represented by more than a hundred graduates and the list tapers to 128 colleges represented by one graduate each.

Technology Women

REVEALING the too-little acknowledged accomplishments of an able group — alumnae prominent in architecture, engineering, science, and education — the M.I.T. Women's Association in coöperation with The Review plans a series of occasional sketches, written by Alumnae concerning Alumnae. We present below the first of these profiles.

GEORGINA POPE YEATMAN

BY ELISABETH COIT

THE daughter of a mining engineer, Miss Yeatman was not born with the conviction that she must become an architect, but early in life she knew that she wanted eventually to become an agriculturalist, an engineer, or an architect. Accordingly at school and college she gave special attention to mathematics and other branches of science. By the time she had been graduated from the College of Arts and Sciences of the University of Pennsylvania, she had decided to study architecture and tried to register in the architectural school of that university. She found, as had other well-accredited women, that, while she was welcome to pursue architectural studies in the School of Fine Arts, she could not become a candidate for an architectural degree. For this reason Miss Yeatman entered M.I.T. and in 1925 obtained an S.B. degree in Course IV. Her formal education did not stop there; she soon found the need for some bridges between her and some houses she wanted to build, so she returned to the University of Pennsylvania to take graduate work in civil engineering.

In 1929, having completed the three years' office practice required in Pennsylvania, she opened her own office, carrying on a varied practice until a year ago. Miss Yeatman's interests are wide: About half of her work has been residential and she likes to collaborate with the garden expert in the development of the grounds around the houses she has designed, including laying out the tract and building roads and bridges in addition to the houses. For her old school — the Shipley School at Bryn Mawr, Pa. — she built an addition; she designed the additions and alterations for the Philadelphia Country Aviation Club and worked on the Pennsylvania Epileptic Hospital and Colony Farm at Oakbourne. Although Miss Yeatman has no favorite type of work, the new Philadelphia School of Occupational

Therapy which she designed in collaboration with the architectural firm of Bissell and Sinkler of Philadelphia, brought her much satisfaction. Whereas other commissions had necessitated the following of some precedent, the design of this school was largely a work of discovery and invention, and the study of existing buildings and of the aims and functions of such a school was made in the joyful light of an adequate appropriation with which to translate those findings into architectural form.

Not interested in self-publicity, and being too busy to prepare for publications about her work, Miss Yeatman became, nevertheless, the most publicized woman architect last year when she was appointed Philadelphia city architect. At that time she decided to undertake only so much private work as would enable her office to maintain itself during her four-year term, for, ideally at least, the city architect's position requires full time. The work to date has been largely advisory and supervisory, as the city has undertaken no extensive new building, but between maintenance and repair of yesterday's achievements and zoning for tomorrow's is a good long day, especially as there have been a number of WPA projects for which to provide plans.

Miss Yeatman takes no credit for her appointment to this post, and she has little to say on the matter of the position of women in architecture. She was once excluded from a professional course because of her sex, but apart from this she thinks that being a woman has contributed few difficulties to her architectural career. She thinks she may have lost a commission or two by being a woman, but herself employs women as well as men and finds both equally capable. Miss Yeatman attributes much of her ability in thinking clearly and her ease in meeting people to her experience of teaching high-school physics at the same time as she was studying fine arts. To the experiences which a decade's architectural practice normally bring, her work as director of the department of city architecture in Philadelphia adds a rather wide social and scientific education in practical values.

Miss Yeatman is a full member of the American Institute of Architects, a director of the Philadelphia Housing Association and of the Octavia Hill Association for low-cost housing promotion and management, and architectural advisor to the Philadelphia Y.W.C.A. Chief among her hobbies are water colors (some of which have been exhibited at M.I.T.) woodcrafts, fishing, hunting, and flying.

S.P.E.E. Convention

TECHNOLOGY and Harvard University will be joint hosts to more than 1,500 members of the Society for the Promotion of Engineering Education who will meet in Cambridge, June 28 through July 2, to discuss problems of modern engineering education. Many of the nation's outstanding educators and industrial leaders are expected to participate in the sessions, with representatives of 128 educational institutions, and 28 industrial concerns having already signified intentions of attending. Discussions concerning both technical and nontechnical aspects of the engineering curriculum, symposiums on the (*Concluded on page 256*)

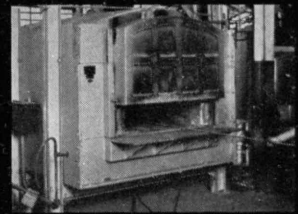
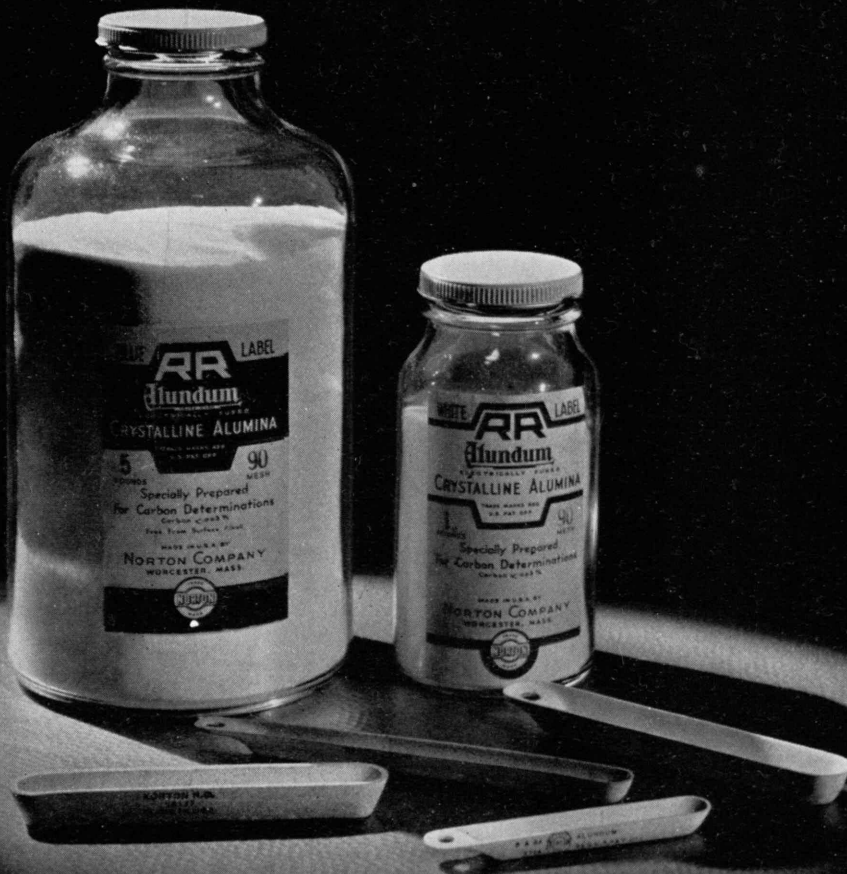
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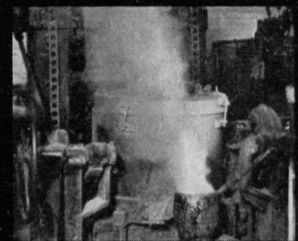
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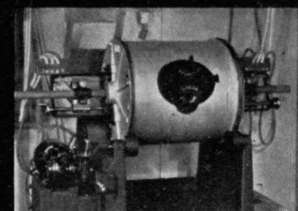
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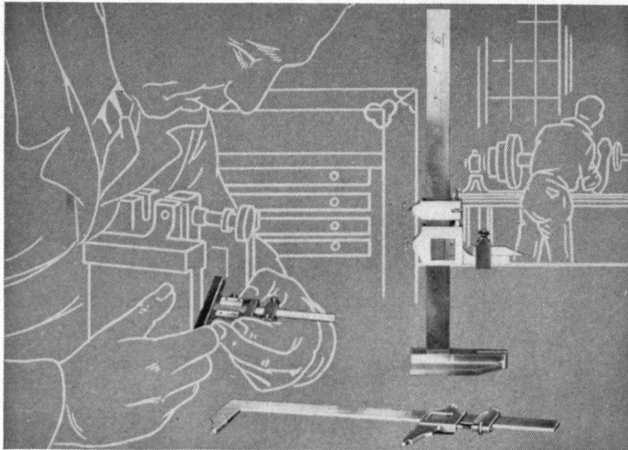


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SCIENCE AND THE STATE

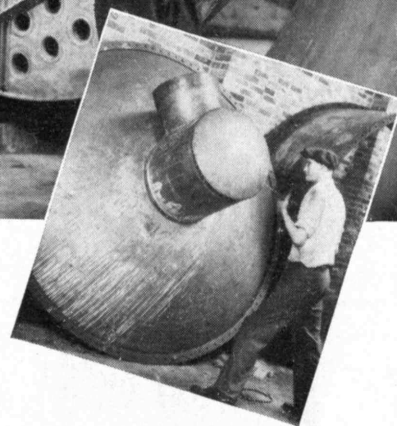
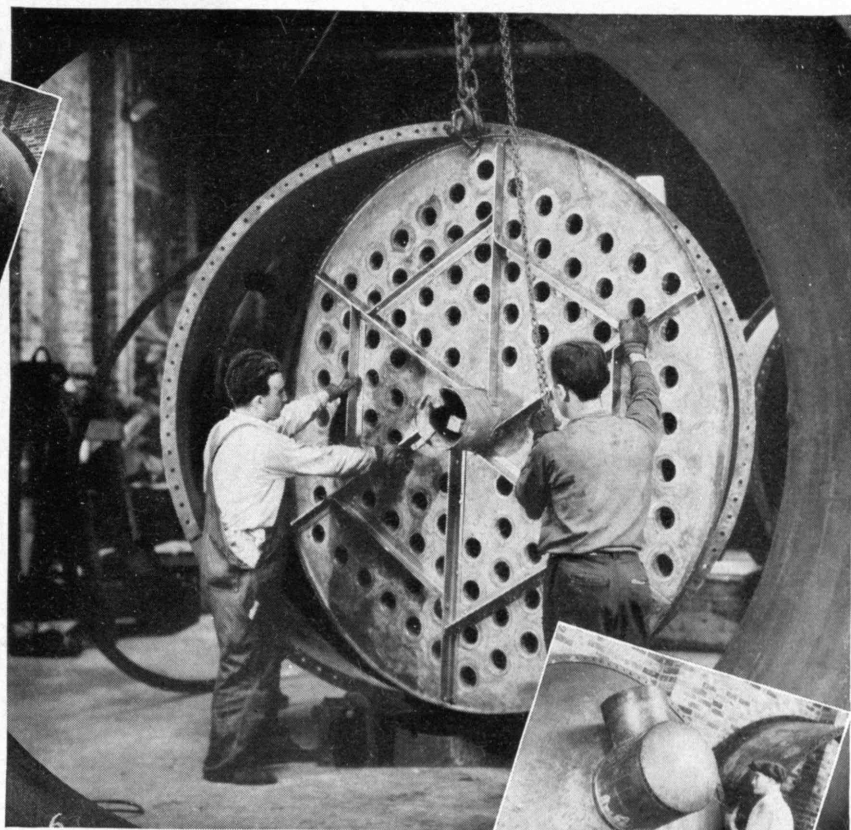
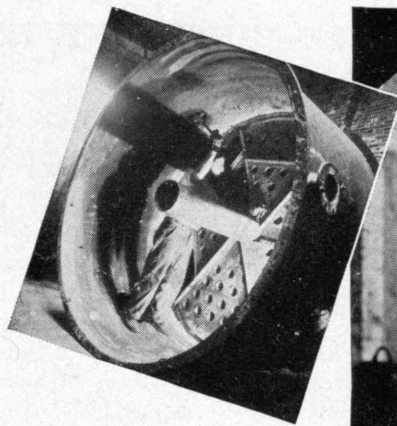
(Continued from page 236)

In simplest form, the fallacious sequence is about like this: Little Johnny could not spend Christmas with Grampa because Grampa has become a gasolandloper and is spending the winter in Florida, in a dummy domicile hitched to the rear of his car. Johnny's Mamma, filled with the sentiment of "Jingle Bells," bewails the decline of stability and the vanishing of Victorian virtue, and consequently denounces the science involved in the internal-combustion engine as being a wrecker of the family and so an antisocial force. We may sympathize with her nostalgia, but we cannot hold with her logic.

An apter illustration of the fallacy involved here is, oddly enough, offered by a representative of science. Dr. Iago Galdston, executive secretary of the medical information bureau of the New York Academy of Medicine, lately declared that "science has given mankind immense control over his environment and over his material world. But science not only has failed to solve the essential problems of human relation but has indeed compounded them and aggravated them immeasurably. I prognosticate that . . . unless science amends its faults, it will, like blind Sampson, bring down the palace upon itself, to its own destruction and to the irreparable disadvantage of humanity." Further, Dr. Galdston maintained: "The scientists have gone on in the quest of truth, so called, caring never a fig for the human consequences, because at rock bottom science is amoral, devoid of ethics, and not concerned with the good, the true, or the beautiful of Socrates or of Jesus."

This remarkable pronouncement has some resemblance to puzzled Pilate's "What is truth?" insofar as we may consider it an official forthputting unconsciously impelled by popular feeling. It betrays also a spirit most typical of the times in its implication of dependency, its suggestion of a bewildered desire for some sort of authoritarian center to which we may look for the solution of whatever difficulties. That the popular mind should have looked to science to play oracle follows from the fact that most other institutions which have exerted authoritarian sway in the past have become emasculated. It is a far cry from the Puritan theocracy of early New England to a modern suburban Protestant church. The rigid discipline of the classics once made the institution of liberal education approximate authoritarianism. It is a far cry from that discipline to the current vitiated A.B. course in "management." However, as the popular mind looks at things, scientific advance has gone on sweepingly, from success to success; what better center of authority?

This desire for authoritarianism, which in Europe has bred dictators, has in the United States overset a few applecarts and may impugn science in the process. It is a fallacy to expect social consciousness of science as such. It is a fallacy to expect the scientist to play oracle on everything. It is not a damning accusation of science to call it devoid of ethics; to demand ethics of science is the same as to expect a locomotive to run in accord with the currently accepted moral *(Continued on page 250)*



"Inside Story"

OF AN ALCOHOL RECTIFIER

THESE pictures show workmen fabricating a "bubble" tower alcohol rectifier, furnished by The Lummus Company, New York, builders of distilling equipment. The outer shell and the bubble trays are made of Revere sheet copper. The two photographs at the top show one of these trays being jockeyed into position for assembly into the column.

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SCIENCE AND THE STATE

(Continued from page 248)

code rather than with the law of heat transfer. For science is but a body of knowledge, of no fixed limits, in a state of constant flux; engineering is but the physical application of some parts of that knowledge. If in the process of disentangling valuable and beneficial sections of that knowledge, the investigator brings out also some potentially injurious parts, still no ethical allegations can be brought against the inert facts. And if, to avoid uncovering potentially injurious items, we refrain from uncovering anything, we lose, and lose vastly, no matter what opponents of vivisection or proponents of teachers' oath laws may say about it. It is not the facts themselves which work any possible harm, but our use of them. That use, in the ultimate analysis, rests in the hands of butcher, baker, candlestick maker, of everyone who owns a share of stock, drives a car, sends a telegram — in the hands of the body politic, which is then its own exploiter.

To expect social consciousness, or virtue in the Socratic sense, from the scientist and the engineer is quite a different matter, however. The expectation is just, and it is generally well met. Socrates himself was never more insistent upon honest definition than the research man must be if his work is to succeed. Concern with the true of Socrates and of Jesus is not in any sense necessarily diminished or stultified by concern with the true of science; each is but an approach to the same unknown. The scientist, if anyone, must be rigorous in his devotion to an unforgiving, demonstrable truth, uncushioned by any of the emotional easements surrounding the truth as perceived by some other callings. A definition of social consciousness which would include deviation from scientific truth is too weak to merit debate. The impatience of compromise which is bred by scientific investigation may, it is true, jar on representatives of institutions which trade greatly in compromise. The seeming unemotionality of science likewise may be misinterpreted. But if we may assume that human society is a result of the three forces of compromise, emotion, and intelligence, the scientist very definitely must be classified as within the socially conscious range, insofar as his work is both the application and the intensification of intelligence. Extending the popular fallacy from science alone to include the scientist, then, is adding error to error. And to denounce the scientist for the commonweal's difficulty in assimilating science is folly as well. The part cannot do the work of the whole.

The sound view of the question is suggested in that part of President Roosevelt's letter which argues that engineering, in addition to the design and construction of civil engineering works and instruments of production, "must also consider social processes and problems, and modes of more perfect adjustment to environment, and must coöperate in designing accommodating mechanisms to absorb the shocks of the impact of science."

By its use of the verb "coöperate," this statement puts science in its proper status as a part of the whole. An earlier portion of the letter is also suggestive, but in dangerous fashion. There, the *(Concluded on page 252)*



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INFORMATION ON M. I. T.

THE TECHNOLOGY REVIEW BUREAU exists to supply authoritative information to anyone interested in details regarding the Massachusetts Institute of Technology. It serves as a clearing house for inquiry and aims to further the spread of exact information regarding entrance requirements, outline of courses, subjects of instruction and other information which may be of aid to the students considering undergraduate or graduate study at the Institute.

The Institute publishes a variety of bulletins, as well as a catalogue of general information essential to the entering student. The Technology Review Bureau will be glad to send, gratis and post free upon request, one or more copies of any publication listed below, or to forward any special inquiry to the proper authority.

Ask for the following pamphlets by their descriptive numbers

1: For general information, admission requirements, subjects of instruction, ask for Bulletin 1.

2: For announcement of courses offered in Summer Session, ask for Bulletin 2.

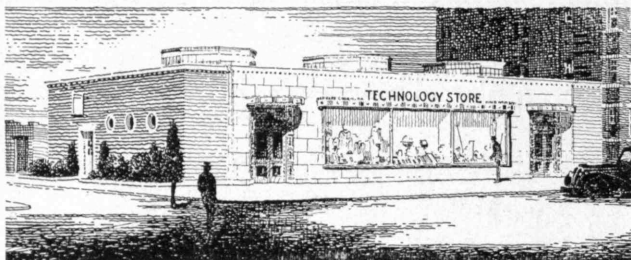
3: For information on courses in Architecture, both Undergraduate and Graduate, ask for Bulletin 3.

4: For a popular presentation of Educational Opportunities offered at M.I.T., ask for Bulletin 4.

All inquiries sent to the address below will receive prompt attention

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*CORRESPONDENCE FROM AN ALUMNUS WILL
HAVE THE MANAGER'S PERSONAL ATTENTION*

SCIENCE AND THE STATE

(Concluded from page 250)

President remarked: "In respect of the impact of science and engineering upon human life — social and economic dislocation as well as advance in productive power — the facts are revealed with distressing clearness in public records of unemployment, bankruptcies, and relief." Here it should be noted that in their proper status scientists and engineers have not been found wanting; their applications of physical fact have spectacularly lengthened and bettered man's existence — where given the chance — within a generation. If having his own part of the job well in hand is the first requisite of a coöperator, the scientist and the engineer will pass muster.

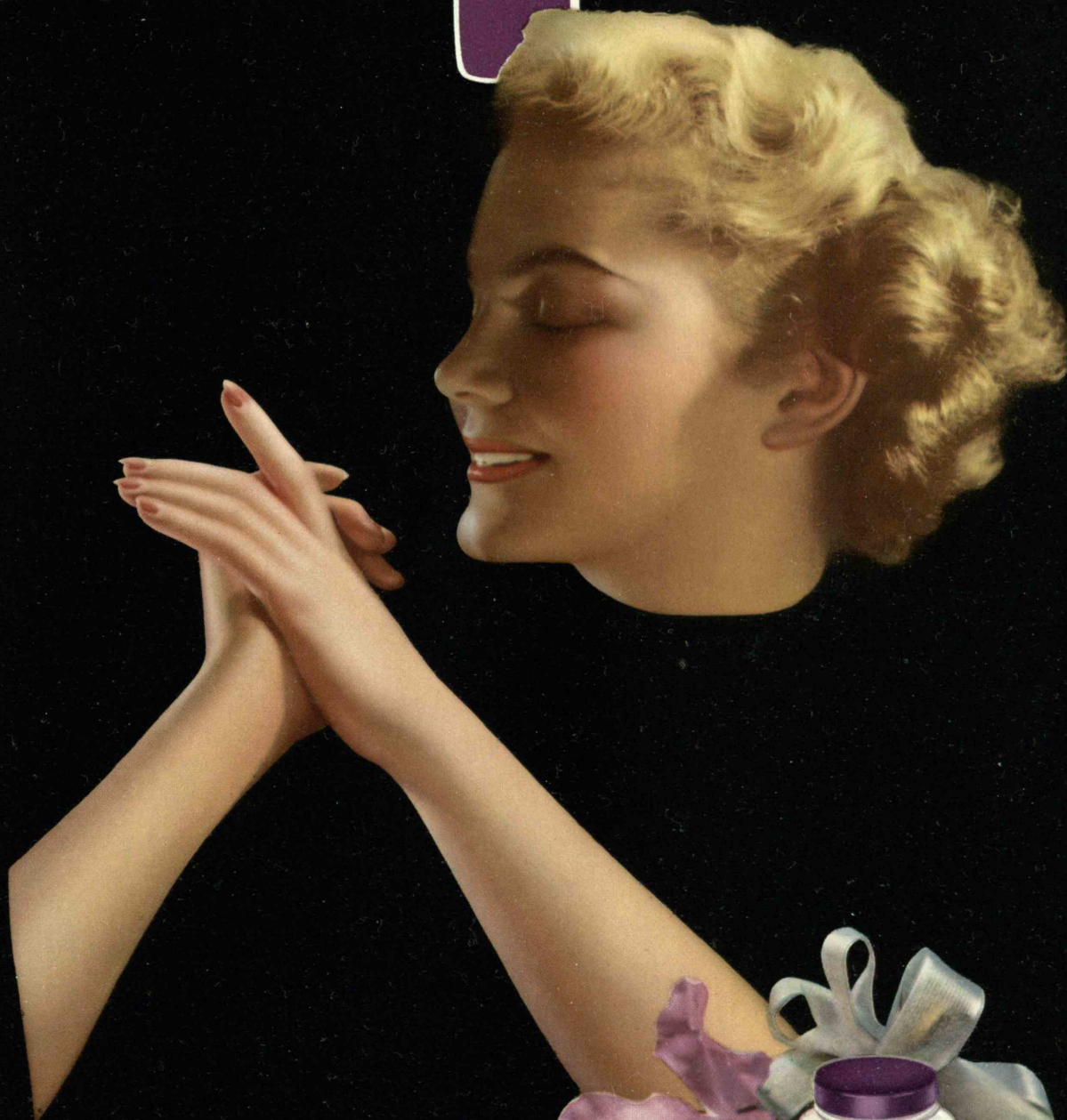
But coöperation implies partners in enterprise. We may argue that the impact of science upon human life — beneficial to the individual, as we have seen — has been made a source of maladjustment through either the atrophy of receiving institutions or the antisocial exploitation of science by nonscientists. Those institutions in the social complex concerned not with scientific investigation but with other activities — law, economics, ethics — which seem by the "public records of unemployment, bankruptcies, and relief" to have failed in the production of the requisite coöperators must then look to themselves. The type to be sought is already fairly well defined. We need more nonscientists who can make as good ethical use of science as the present administration has in those of its acts which have been scientifically constructive. We need not argue with the scientist about the morality of the table of the elements; we need seriously to argue with bar associations, for example, which find things "unethical but not dishonest," with church vestrymen collecting rents for the church on Old-Law tenement firetraps, and so on.

Worse luck for us in some ways, perhaps, we seem to be born imbued with the idea of a something which we call progress, a something entangled with concepts like that of the greatest good for the greatest number, which in turn we seek to reduce to tangible terms. Out of this effort come both the extension of plumbing service and the idea that exploitation of his physical environment is incumbent on man — a sort of involuntary duty which justifies his existence. The successive forms which the state ideal has taken in the course of Western culture, advancing from chaotic despotism to ordered freedom in democracy — let it be said in the face of contemporary retrogressions in Europe — are an evolution bred of that idea. But evolution is a continuing thing. The creed of democracy — of a general diffusion of the benefits of society, equal opportunity, well-being, freedom — even if we fall far short of it in practice, is fundamentally the driving force of scientific investigation. The state which follows that creed will inevitably produce scientific advance; so clear is the sequence that we might easily conclude that, allowed to develop democratically, the state ultimately would give place to science, much as autocrats have had to give place to the state. Then, with time, the pendulum with which we began would cease swinging.

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SOIL SCIENCE

(Continued from page 234)

stable. In this case even the type of settlement which might develop as a result of the indicated failure was not clearly established. Most predications were that if settlement of the dams was pronounced, the final profile developed under a typical cross section would be parabolic in general character, with maximum deformation of the underground occurring under the maximum concentration of load at the center line of the structures.

Initial investigation in the Eastport laboratory was made by means of model studies. Already set up in the laboratory was a simple polariscope (Fig. 5) previously used to study the distribution of shearing stresses in gelatin models by photoelastic methods. By gradually increasing the height of the model dam, the gelatin was finally made to fail under the load. Settlement of the model embankment resulted in the type shown in Fig. 6. This picture, a view taken through the analyzer, indicates the shape and outline of the embankment section after failure. It shows also a number of stress bands in the gelatin out beyond the toes where evidently the gelatin was not overstressed. Interesting though this last point may be to some, the particular object of reproducing the view in Fig. 6 is to show the character of deformation which took place under the embankment. It was quite clear that settlement was not maximum under the center line in this case, but that maximum settlement was reached at points on either side of the center line, about halfway out toward the toes. This experiment was repeated a number of times under a fairly wide range of controlling conditions until it was established as being typical. From this work the type of settlement obtained was termed "heart-shaped" due to its resemblance to the lower part of an inverted heart.

Although some aspects of the work with this model were favorably considered, it was realized from the beginning that it fell short of being a completely satisfactory model in many ways. To eliminate some of the sources of dissatisfaction, a second type of model was developed for the purpose of making this particular study. In this second model the material used to represent the underground was clay, a good deal of which was obtained from samples taken at the actual damsites, and the proportions of the model were changed so that the axial length of the section of dam being studied was considerably greater.

Fig. 7 gives a general view of the apparatus in which this study was conducted. The procedure was to build up a bed of clay in the rather shallow tank and then to construct across the center a model dam, following, as nearly as possible, the method proposed for construction of the prototype. In one side of the tank a window was provided so that movement of the clay under the embankment could be watched during a test. To facilitate this observation, small white reference points were inserted between the clay and the window prior to loading. Successive positions at each point were marked on the glass so that at the end of each test their individual paths were determined. At the center of the model, in a section perpendicular to the axis of the dam,

*(Concluded on page 254)***BONDS**

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SOIL SCIENCE

(Concluded from page 253)

a series of vertical reference lines was inserted. The deformation of these lines could not, of course, be observed during test but were exposed afterwards by cutting the model along the midsection. A view of such a section is shown in Fig. 8. Here the reference lines may be seen clearly. Also plainly visible are the so-called mud-wave formations on either side of the embankment. These mud waves are not so uncommon in general engineering practice as they might be. A few months ago, while passing through Boston, the writer had an opportunity of viewing an excellent example of this type of formation, where an approach to an overpass in a new piece of road construction had failed in this way.

The confirmation which this clay model afforded of the results previously obtained was very encouraging. Even more encouraging was the fact that observation of the movement of the reference points in the model led to an explanation of the peculiar type of settlement and to the development of a serviceable analytical method. The explanation of the type of settlement is that movement of the fill material and underground was not straight downward but was of a circular nature, as may be seen in Fig. 7. The fill material located at the two points of maximum settlement was originally placed at the center line of the structures and moved gradually downward in a circular path to its final position.

The use of the above mentioned methods of analysis indicated that settlement of the rock-fill sections of the original design would, in general, be a very large proportion of the depth of the clay overburden. In some cases it was found that settlement would continue unchecked until the fill material came to rest on the rock surface itself. However, it was then determined that in spite of this excessive settlement, it would be more economical to adopt the general proportions of the original design and to provide for the additional material needed to offset the settlement, than to adopt a design with side slopes sufficiently flat to prevent settlement of this type.

The above conclusions were given consideration when the usual seepage analysis was made for the Eastport structures. Fig. 9 shows a model dam constructed for making a seepage study. The expected settlement of the rock-fill section was reproduced in the model as shown, and from this illustration its magnitude with relation to the other parts of the embankment may be seen clearly. The underground material was represented simply by sealing off the model at the clay surface, it being assumed that, for all practical purposes in the prototype, no flow would take place through the clay.

In the current program of earth-dam construction of the Army Engineers, the adoption of methods similar to these is at present proceeding at such a rate that men with sufficient training and experience to staff its laboratories are becoming increasingly hard to find. This situation should make soil mechanics an interesting and valuable field of study for undergraduates. For practicing civil engineers the possibilities of soil mechanics are gradually becoming more apparent. In course of time it should reach the same stage of utility as now enjoyed by modern methods of structural or hydraulic designing.

THE SOLID MATTER MYSTERY

(Concluded from page 239)

from each atom is there confusion; near each atom is almost regularity. To misquote the White Queen's remark to Alice: "We have confusion every other day; yesterday and tomorrow, but never today."

And now a very important fact becomes apparent: Only a few types of crystal structure can allow this sort of caricature without leaving some of the bonds unjoined, *i.e.*, without breaking. The B_2O_3 structure can allow it because the oxygen has only two bonds, which can bend somewhat. On the other hand, the diamond lattice is linked in such a way that this is impossible. The quadruple bonds provide a cross bracing which forbids any rearrangement. In SiO_2 the double arms of oxygen can bend enough to form a glass, but in NaCl the cubic structure locks the atoms into a regular pattern. One can go through the whole list of crystal structures found in nature and pick out the few which can form glasses.

This is but a glimpse of the fascinating possibilities in the study of solid structure. There is much yet to be done. Even in the problem of glasses there is still some disagreement as to details and points of view. Nevertheless, the picture we have obtained will be of inestimable help to the glass technologist. Further work in other lines, both theoretical and experimental, will clear up other engineering problems: Study of the structure of metals will tell us what alloys are possible; knowledge of the structure of rubber may lead to the improvement of artificial rubber; theoretical studies, based on a picture of the structure of liquids, may solve the problems of solutions and solubility. Organic chemistry did not begin its extraordinary growth until the chemist began to study the structure of the organic molecule. A knowledge of the structure of solids may produce a similar far-reaching revolution in our methods of dealing with matter in bulk.

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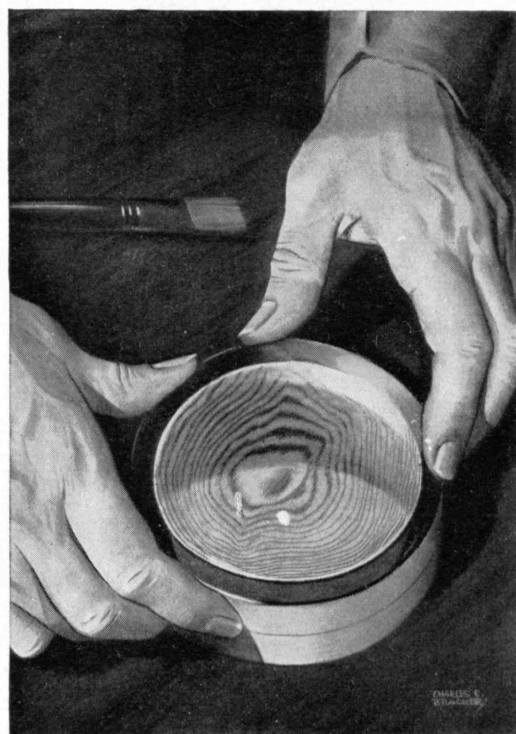
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THE INSTITUTE GAZETTE

(Concluded from page 246)

relation between university and industry, and inspection of Harvard and Technology electrical engineering laboratories will feature the program.

At the conference dinner, presentation will be made of the Lamme Medal, awarded annually by the Society for distinguished achievement in engineering education.

Much of the conference program will be conducted at general sessions of all members, although some of the more specialized topics will be taken up at smaller round-table groups. Those subjects believed to be of sufficient general interest to be presented to all participants include the presidential address of Professor H. P. Hammond of Brooklyn Polytechnic Institute on "The Teacher: A Human Being," and addresses on "Social Responsibility of the Engineering Teacher," "The Role of the Engineer of Tomorrow," and "Looking Ahead in Engineering Education." Round-table groups will consider some of the more limited aspects of these general topics as well as specialized questions of particular interest to the members of these individual groups. The smaller groups will also permit more lengthy discussion than the plenary sessions, although comment of general interest will be encouraged at all times.

Corporation Notes

GORDON S. RENTSCHLER, whose election as a special term member of the Institute's Corporation was announced in January, was appointed a member of the Committee on Finance at the meeting of the Corporation on March 10. Mr. Rentschler is president of the National City Bank of New York.

Halfdan Lee, elected to the Corporation at the same time as Mr. Rentschler, has been appointed to the Corporation Visiting Committee of the Department of Economics and Social Science. Frank D. Comerford and Edmund C. Mayo, both special term members, have been appointed to the Visiting Committees of the Departments of Electrical Engineering and Business and Engineering Administration, respectively.

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TREND OF AFFAIRS

(Concluded from page 231)

combinations of other conditions that might affect the quality of the concrete have been tested. This kind of experimentation does not seem extravagant until one considers that these are interdependent variables and that the quality of concrete is not measured by a single index. One must try each combination of conditions to see how it affects a whole line of important properties of concrete, such as compressive and tensile strength, volume change, thermal conductivity, durability, cost, heat generation, weight, elasticity, plasticity, and others.

Since the empirical methods that gave useful results in the early elementary problems are now both inapplicable and wasteful, a long-range program of cement and concrete research has been inaugurated in Technology's Department of Civil Engineering. Its fundamental objective is to study by modern methods the structures and processes which, too small to be observed directly, are essential in the production of concrete of maximum value. Some cut-and-try experimentation is being carried on because it is necessary for the solution of immediate problems, but much work, dealing with primary actions and structures, is being done without any immediate concern for application or practicality. Pure compounds of cement are being studied, first separately and then in combination. Particle sizes are being investigated. Tests are being made to determine the distribution of pore sizes in the gel under controlled conditions, the corresponding degrees and rates of hydration, and the fundamental structures and their changes. The potential gel-producing capacity of each of the pure compounds of cement is being determined.

That the results will have practical value is already indicated. The measured values of shrinkage upon drying of the hydrated compounds, for example, have suggested the composition of cement conducive to low volume change. More important, they have shown that the shrinkage of ordinary concrete is greater than that predicted from the individual behaviors of the constituents. This second result has indicated that the aggregate does not properly serve to protect the ordinary concrete against shrinkage, and has led to the finding that replacing part of the aggregate by another of different composition greatly reduces the shrinkage. An inexpensive process may be found for treating the aggregates to increase their power to protect concrete against shrinkage. The aim of the investigators, who include R. W. Carlson, W. C. Voss, '32, W. K. Lewis, '05, D. Peabody, '10, and G. Broughton, is to keep such basic facts coming along at a rate that will keep research in step with the resumption of building construction.

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Nature smiled, and, as though in gracious response, this new type of reunion . . . seemed to have reached maturity. In the solidity and importance of its serious events, and in the gaiety, warmth, and good-fellowship of its lighter program, Alumni Day . . . seemed an adequate fulfillment of the hopes of those who have championed the plan."

Thus did The Technology Review editorialize after Alumni Day last year, thus did it seek to describe what an extraordinarily delightful and satisfying reunion it proved to be. And thus did it suggest what *you* may expect *this year* on June 7. Since Alumni Day was started, three years ago, it has turned into life and action two of Technology's grandest songs:

And Life slips its tether, When good fellows get together With a stein on the table IN THE FELLOWSHIP OF SPRING.	} and {	Take me back on a special train To the glorious Institute— I yearn for the inspiration of A TECHNOLOGICAL TOOT!
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Felicitations

☛ To WELLES BOSWORTH '89, on being reelected to the presidency of the University Club of Paris. Mr. Bosworth was the first president of the club and now starts his sixth term.

☛ To TENNEY L. DAVIS '13, on being honored by election as corresponding member of the Bohemian Royal Society of Letters and Sciences.

☛ To CARL T. LEANDER '20, on receiving the Sebert E. Davenport Memorial Prize of the Harvard Dental School as "that member of the senior class who during his four-year course . . . best . . . upheld the ideals of the school in loyalty, character, high scholastic standing, and quality of work."

☛ To J. EDGAR PEW '26, Vice-president of the Sun Oil Company, on receiving the Anthony F. Lucas Gold Medal for "vigorous promotion of the program of standardization of oil-field equipment."

☛ To BERNARD S. GOULD '32, on receiving a fellowship for study of microbiological chemistry at the University of Louvain. This fellowship was granted by the Commission for Relief in Belgium Educational Foundation, Inc.

☛ To WILLIAM I. H. BUDD '36, on receiving the American Bureau of Shipping Prize for 1936 "for excellence in studies in naval architecture and marine engineering."

Wellesley's Summer Institute

☛ DR. KARL T. COMPTON, President, is a member of the governing board of the Summer Institute for Social Progress which will hold its fifth annual economic conference at Wellesley, Mass., for men and women, from July 10 to 24. The topic this year is to be "The World Challenge to Democracy; How Can America Meet It?" Dr. Colston E. Warne, professor of economics at Amherst College, will head the faculty of experts.

Quotations

☛ "A Connecticut Yankee is stepping across the centuries, not into King Arthur's court but into the literary world of the Mayan civilization. He is having the thrill of reading slowly — but very surely, as he

believes — words in Mayan books that were last read and understood by Mayan Indian scholars in their temple libraries in Yucatan, centuries ago. . . . At the annual meeting of the American Anthropological Association, this young man from Wethersfield, Conn., BENJAMIN LEE WHORF ['18], surprised his fellow research workers by reading off sentences from two of the famous Mayan books." — *Science News Letter*, February 20.

☛ "Most of us don't have our radios on loud enough (antinoise campaigns to the contrary), according to the recent results of experiments by a Boston acoustical engineer. 'The trouble is that people are afraid to turn on the volume and really enjoy good music,' asserted BENJAMIN B. DRISKO ['23]. . . . 'I noticed that there was considerable difference between the original product in the concert hall and that which came over my radio set. . . . So I set to work to build a new model which would bring in a few of these doubtful sounds a little more clearly.' . . . The actual technical details are somewhat involved, but briefly his apparatus consisted of a mechanism which built up the extreme 'high' frequencies and extreme 'low' ones." — *Boston Herald*, February 21.

☛ "LIEUTENANT BEN KELSEY ['28], returning to Wright Field one night in a Martin B-10B, had reached the vicinity of Columbus, Ohio, when the left engine quit 'as though the switches were cut.' After some gas valve and ignition switch manipulating, the engine started up with the gas valve in the 'off' position, gasoline flowing freely from the exhaust pipe. On starting, the flames ignited the gasoline on the wing, which also ignited the fabric rear portion of the wing. The engine then began to operate normally. . . . A few inches from the aileron the fire lost, and Lieutenant Kelsey . . . shot a 'hot' flapless landing successfully at Wright Field with only a little more than half the left wing surface remaining." — *Air Corps News Letter*, February 1.

☛ The late "DR. ELIHU THOMSON, the revered 'dean of American Engineers,' is one of the truly great pioneers in the field of applied electricity; but

he is no less truly a pioneer in pure science. He is a person of international renown, for his influence, like that of all great intellects, transcends the boundaries of nations, and will endure beyond the calendars of the years." — *Journal of the Patent Office Society*, February.

DEATHS

* Mentioned in class notes.

☛ ELIHU THOMSON, Staff, March 13. See above.

☛ CLARENCE H. JOHNSTON '80, December 29. An outstanding architect, Mr. Johnston left "enduring monuments to himself in many public and institutional buildings." His plans for a new section of the University campus at St. Paul, Minn., are even now in the process of materialization.

☛ FRANK F. JOHNSON '84, January 4. For 17 years president of the Idaho Power Company, Mr. Johnson was a leader in the development of Idaho banking and public utilities.

☛ WILSON B. PARKER '88, January 6.*

☛ EDWARD V. SHEPARD '89, February 9. After following the profession of engineering for some years in South America, Mexico, and Massachusetts, Mr. Shepard turned his attention to the mathematical element in bridge and has written a number of books on auction and contract bridge.

☛ NATHAN C. W. CHAPMAN '94, February 17.

☛ RICHARD BROWN '95, February 2.*

☛ ALF C. LOOTZ '96, February 21.*

☛ JOHN A. ROOT '06, August 29.

☛ HERBERT S. WHITING '06, February 16.*

☛ TSOK K. TSE '08, January 5.*

☛ KANEZO GOTO '11, February 6.*

☛ LEW W. BEASON '12, January 10.*

☛ LOUIS L. WISNEW '17, January.

☛ ELDRIDGE B. GEORGE '21, February 3.*

☛ LOUIS ALBISTON '32, September 4.

☛ L. EARL ROWE, February 17. A member of the Department of Architecture at M.I.T., 1910 to 1912, Mr. Rowe became director of the Museum of Art at Rhode Island School of Design and, later, musical director at this school. At one time he was an assistant in charge of the Egyptian department at the Boston Museum of Fine Arts.

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

Technology Club of Hartford

The December dinner meeting at the University Club proved entirely successful, judging from the better than average number of men attending and the evident interest created by the speaker, one of our own members: Benjamin L. Whorf '18. Mr. Whorf took for his subject, "The Chemistry of Language and Thought," outlining the manner in which the science of linguistics can be applied to the study of ancient or prehistoric civilizations. He also described his scientific method of approach in deciphering Mayan hieroglyphics. Incidentally, Mr. Whorf is credited with being the first to translate a complete Mayan sentence and was recently made an honorary fellow of the Anthropological Society at Yale. The interesting thing is that Mr. Whorf's interest in this field is in the nature of a hobby, since in his regular business life he is a fire prevention engineer for one of Hartford's leading insurance companies.

The 30 members attending the meeting of February 15 were treated to a timely discussion of the issues involved in connection with President Roosevelt's proposed plan for increasing the number of justices in the Supreme Court. Dr. John S. Custer, head of the department of history at Avon Old Farms School, was the speaker. Those present were the following: F. I. Davis '92, E. C. Alden '95, H. I. Wood '01, E. W. Pelton '03, E. P. Tripp '04, M. G. Wight '06, G. L. Mylchreest '10, R. H. Mather '11, A. F. Peaslee '14, N. J. Vile '16, M. S. Wellington '16, B. L. Whorf '18, W. J. Scott '18, H. W. McIntosh '19, M. B. Turtle '21, F. O. A. Almquist '23, T. H. Coe, Jr., '23, W. S. Wise '23, L. J. Porter '24, E. N. Bidwell '26, G. A. Fogg '26, R. J. Martin '26, E. C. Wheeler '26, M. P. Thomas '30, W. H. Brothwell '33, A. J. Minkus '33, E. Garaventa '35, P. A. Smith '35. A most welcome visitor was Joe Levis '26 from Boston. — GEORGE A. FOGG '26, *Secretary*, 164 Wethersfield Avenue, Hartford, Conn.

M.I.T. Club of Northern New Jersey

Northern New Jersey yearners for the inspiration of a technological toot will enjoy a rare treat on Wednesday evening, April 7, when the third annual banquet of the Club gets under way at the Newark Athletic Club at 6:30 p.m. Outstanding speakers and plenty of entertainment, together with the good food and comfortable atmosphere of our usual meeting place, assure an evening of informal sociability which promises to exceed by far the most enjoyable events of previous

years. Dr. Compton, our Number 1 charter member, has graciously consented to be with us to observe our anniversary meeting. Charles E. Locke '96, Secretary of the Alumni Association, will travel far afield to see for himself how the infant Club has grown and to favor us with a series of those famous witticisms which are always forthcoming after a few puffs on that Secretarial peace pipe of such generous proportions.

The Committee has confided that serious fare will be presented by Will U. Laff of indeterminate scientific affiliations. Informal dress and the extreme informality of a good old-fashioned get-together are the order of the evening. Everyone is hereby invited. For further details and tickets communicate with the undersigned.

On February 4, the Newark Athletic Club was the scene of the second smoker of the season's series of three evening meetings. Two hundred and fifty men were present to hear vitally interesting talks by two members of the Club. John Johnston, director of research of the United States Steel Corporation and onetime member of the Research Department of Physical Chemistry at the Institute, presented unusual side lights on the steel industry in his well-received discussion of "The Magic of Making Steel." Joseph P. Maxfield '10, director of commercial engineering of Electrical Research Products, Inc., and once an instructor in the Institute's Department of Physics, gave a most interesting message on practical applications of a new scientific development in "The Commercial Aspects of High-speed Photography." Illustrative films of both the Edgerton-M.I.T. and ERPI-Eastman methods were shown. The new 1937 reel of Edgerton high-speed pictures formed a fitting climax to the program.

Music and entertainment were in the capable hands of Dick Ranger '11, who led the songs and cheers and also presented 12 young lads from his famous boys choir. Tuneful Gilbert and Sullivan selections, several soprano solos, and an *a cappella* "Ave Maria" brought long rounds of sincere applause. A buffet supper and ample opportunity for all to meet and mix brought the evening to a close.

Our hearty thanks are extended to the speakers and entertainers and to the committees and individuals, here and at Technology, who made the meeting possible. Mr. Earle of the Newark College of Engineering, the Public Service, and the General Electric all generously cooperated in the motion picture presentation.

The Club has organized a group of regional chairmen who are actively contacting the 100 prospective Technology students in our district who request information or scholarship aid. Monthly luncheons are held at noon on the second

Thursday of each month at the Newark Athletic Club. Alumni of northern New Jersey who have not received mail notices of meetings are requested to address the Assistant Secretary. — CAROLE A. CLARKE '21, *Secretary*, 10 University Avenue, Chatham, N. J. FREEMAN B. HUDSON, JR., '34, *Assistant Secretary*, Colgate-Palmolive Peet Company, 105 Hudson Street, Jersey City, N. J.

Technology Club of New York

The annual alumni dinner of the Club was held in the main ballroom of the Waldorf-Astoria Hotel on the night of February 24. More than 350 Technology men and their guests were present. The affair had the aviation industry as its central theme, and two major steps in the progress of the industry were announced at the dinner. The first was the announcement by President Compton of a revolutionary new wind tunnel which will be built at Technology at a cost of about \$150,000 and will be dedicated as a memorial to the Wright brothers at the International Congress of Applied Mechanics which will meet in Cambridge, Mass., in 1938. The second was the announcement by Juan T. Trippe, President of the Pan American Airways, of first details of a new four-engined stratosphere plane capable of flying at 35,000 feet.

Robert E. Rogers, professor in the English Department at the Institute, was toastmaster for the occasion. He was introduced by Alfred T. Glassett '20, President of the Club. In a few introductory words Mr. Glassett told of the progress the Club has been making and stated that it is in a position to get its own building in New York within the next few years. He welcomed all Technology men and invited those who were not members to join and share in the valuable work and good-fellowship of the Club.

Before introducing the speakers, Professor Rogers, who described himself as a "settlement worker in the slums of English," made a short speech debunking the popular notions of a student's life at Tech, for the edification of the lady guests. His humorous remarks, stripping the Technology student's life of its glamour of gifted genius, intense concentration, and bare asceticism, were much enjoyed by the audience. Dr. Compton reported that encouraging progress was being made on the plan, announced last year, for obtaining new facilities to meet the pressing educational and research needs of the Institute. These include scholarships and fellowships, funds for research, a dormitory, a gymnasium, a high-voltage laboratory, and an endowed biological laboratory.

In describing the new wind tunnel, which will be built under the direction of Jerome C. Hunsaker '12, Dr. Compton

pointed out that by means of a special pump it could be operated in either compressed or rarefied air and thereby match the Reynolds' number of the huge government wind tunnel at Langley Field, or be made to simulate conditions of a plane operating at 400 miles per hour in the stratosphere.

The stratosphere planes described by Mr. Trippe have been under development for eight months in a carefully guarded project, and orders for the actual construction of the first two will be placed in a few days. These 21½-ton airliners, he stated, will have cylindrical bodies that can cruise at altitudes four and five miles above the earth at 270 miles per hour. The field for their probable operation was not indicated, but Mr. Trippe, in another part of his address, expressed hope that regular service could be established across the Atlantic in the near future. The planes will be capable of crossing the Atlantic Ocean in ten hours, he said. The stratosphere airliners will be built to withstand an internal pressure of six pounds to the square inch above that of surrounding atmosphere. This will provide, at 20,000 to 25,000 feet, cabin conditions now encountered at present flight levels of 8,000 to 12,000 feet.

A bright, sophisticated Broadway review featured the entertainment on the stage, following the speeches. It was very well received. Cheers during the evening were led by Robert Emery '34. The dinner formally ended with the customary community singing of the Stein Song. Many members then adjourned to the Empire Room of the Waldorf for dancing. Through the courtesy of the Club this supper room was open without cover charge to all persons who attended the dinner. — ROBERT EMERY '34, *Secretary*, 22 East 38th Street, New York, N. Y. CONSTANTINE S. DADAKIS '34, *Publicity Committee*, 644 Riverside Drive, New York, N. Y.

M.I.T. Club of Western Pennsylvania

The Club held its regular meeting at the Pittsburgh University Club on December 7 under the able leadership of Vice-president Helfman '24, who took charge in the absence of E. A. Holbrook '04, who was away from Pittsburgh. Thirty-two members were present. P. V. Faragher '13 of the Aluminum Company of America presented a most interesting illustrated talk on aluminum. He went thoroughly into the history of the development of this ubiquitous element, then covered the various steps in the mining, preparation, fabrication, and present applications of this metal. This is the 50th anniversary of the discovery of the present method of manufacture of aluminum.

The annual undergraduate luncheon of the Club was held on Tuesday, December 22, in the Adonis Room of the William Penn Hotel. The attendance totaled about 35 persons, including nine undergraduates of the Pittsburgh district who were guests. Vice-president Helfman welcomed

the undergraduates and explained to them the purposes and activities of the Club, then introduced Frank Chesterman '05, who gave us a short talk in his usual interesting style. It was a pleasant surprise to have as our guest Maurice R. Scharff '09, former member of our Club, who is now located in New York City. Mr. Scharff gave a brief talk with words of encouragement to the undergraduates.

The January dinner of the Club was held on Thursday, January 28, at the University Club, with about 30 members present. After the usual excellent dinner, President Holbrook introduced the guest speaker, C. E. McCollum, district traffic agent of the Transcontinental and Western Air, Inc., who gave us a fine talk on "Recent Developments in Aerial Transportation." Mr. McCollum spoke mostly on the improvements in transport equipment and on the new mechanical aids to flight. The members were very interested and kept him on his feet nearly an hour answering their questions.

Jack Nichols '22, former President of the Club, who is now located on the West Coast, was in town recently and attended the luncheon on Friday, January 22. — CHARLES M. BOARDMAN '25, *Secretary*, Duquesne Light Company, 435 Sixth Avenue, Pittsburgh, Pa. JOSEPH L. THISTLE '32, *Publicity Secretary*, Burrell Technical Supply Company, 1936 Fifth Avenue, Pittsburgh, Pa.

Technology Club of Virginia

The Club continues to hold its regular monthly luncheon meetings at the Westmoreland Club in Richmond. These meetings are held on the fourth Monday of each month, at noon. Throughout the winter season there has been a fair attendance of from 15 to 20 Alumni at each luncheon. We would like to take this opportunity again to extend an invitation to all local and visiting Alumni to join us at these meetings.

One dinner meeting was held during the winter season in honor of Professor Thresher's ('20) visit to Virginia. Several secondary-school headmasters were guests at this meeting. Professor Thresher favored us with an informal talk on the affairs and new admissions policies of the Institute. — We find that several Alumni have recently moved into the Virginia area. We should like to have them communicate with us and attend our meetings. We should like also to see more of our regular members attend the meetings. — JOHN J. FAHEY '29, *Secretary*, Virginia Electric and Power Company, Electric Building, Richmond, Va.

Worcester County Alumni Association of M.I.T.

At the fall meeting of the Association, held at The Bancroft, December 9, F. Alexander Magoun '18, professor of humanities, gave an excellent and timely talk on "Men, Management, and the Future." Alumni Secretary Charles E. Locke '96 spoke briefly of Institute activities and plans. Due to the illness of R. H. Brown

'22, chairman of the entertainment committee for the meeting, the program originally planned was postponed. Carl Wilson '34 was called on for stories, and Obie Denison '11 drafted to render his well-known Tech Show songs. The following members were present: Fred H. Bartlett '18, Robert A. Canning '30, Percy J. Colvin '07, F. Harold Daniels '11, Orville B. Denison '11, Daniel P. Dyer, Jr., '32, M. George Green '33, Manuel M. Green '21, Robert N. C. Hessel '27, Frank C. Howard '17, Arthur J. Lariviere '35, Harry M. Latham '93, Charles H. Lusk '23, Oscar T. Marzke '32, Howard S. Mason '35, Philip L. Ober '36, Leonard C. Peskin '29, J. Weston Pratt '24, Carleton A. Read '91, Ladislav Reday '36, Harold L. Robinson '11, John A. Swift '27, Louis E. Vaughan '02, Lewis S. Vose '16, and Ernest P. Whitehead '20 — all of Worcester; Howard F. Atwood '32 of Bolton; Angelo M. Altieri '29, Charles E. Cashman, Jr., '33, Wallace S. Crowell '32, Morris H. Etstein '32, Earl P. Pitts '02, and Andrew B. Sherman '06 — all of Fitchburg; Harold O. Berry '22, Stanford H. Hartshorn '11, Thomas P. Kelly '18, and Roger R. Smith '27 of Gardner; George W. Falk '32, Herbert L. Hayden '23, Clarence M. Joyce '03, and Robert J. Proctor '28 of Leominster; Roger E. Needham '35 of Princeton; Arthur G. Anderson '30, W. Franklin Baxter, Jr., '34, Alanson G. Bowen '33, William P. Canning '36, John E. Perry '34, Ercell A. Teeson '15, Carl H. Wilson '34, and C. Samuel Woodruff '31 — all of Southbridge.

The Association held a meeting on Tuesday, March 16, at 6:30 p.m. at The Bancroft. Moving pictures of the San Francisco-Oakland Bay Bridge recently opened to traffic were shown. This bridge is the longest overwater span in the world. It cost \$77,000,000 and required more than three years to build. Steel for the miles of cable was made in Worcester at the south works of the American Steel and Wire Company. The pictures were followed by 30 minutes of entertainment adapted from a popular radio program. Charles E. Locke '96, Alumni Secretary, was our guest. — JOHN A. SWIFT '27, *Secretary*, 15 Stoneland Road, Worcester, Mass.

CLASS NOTES

1888

Charles G. Merrell, chairman of the board of The William S. Merrell Company, "America's Pioneer Pharmaceutical House," Cincinnati, Ohio, paints the following vivid picture of conditions in his city during the recent flood: "The flood situation in Cincinnati is the worst ever. You can realize this when I tell you that the crest was 79.99 feet. The highest previous stage was 71.1 feet and what we call flood stage is 52 feet. In addition to all this, several gasoline tanks tumbled from their foundations, which were undermined, and the gasoline which spread over the wide area of the submerged district caught fire, with a loss of several million dollars. The Crosley Warehouses

1888 Continued

were burned to the ground, with several other blocks in both directions. Approaches to all the bridges across the river to the Kentucky cities have been closed by the flood waters and the only access has been by the railroad bridge of the Chesapeake and Ohio Railroad, which is transporting those people who have to come to Cincinnati on essential business. Martial law prevails in Covington, Ky., and none but those with essential business are allowed to go over there.

"The public buildings everywhere are filled with people who have been taken from their homes, and many of these did not leave until too late to get out without the help of boats. Order has been wonderfully preserved in the city in this hectic period and much credit is due to our city manager, C. A. Dykstra, who has been given dictatorial powers, and it has not been necessary, therefore, to introduce martial law. The city has been without light for several days, although some of the flood towns which have their own light plants have had all essential utilities operating throughout this period. The waterworks and power house which is owned by the city gave service to the last moment but had to quit when the river rose to 74 feet, and water is being rationed an hour or two a day throughout the city. Lamps and candles have been at a premium and the stock was at one time exhausted but may have been replenished recently. Fortunately, our gas, which comes from Kentucky, West Virginia, and northern Ohio, has been available as usual.

"The Merrell laboratory has been shut down for several days, not because the water is up to the street surrounding us but because of backwater through the sewers. This put out our fires under the boilers and got into the generators, which will have to be reconditioned before we start up again. I understand that about 75 prisoners from the workhouse here were sent out to help fight the fire, Sunday, and every one returned to the workhouse after his job was done.

"I commenced my term as county commissioner the first of the year and have been rushed with one thing or another ever since, and now it is every day until a late lunch time, and I do not get to my office until two or three o'clock in the afternoon. Fortunately, about a year ago I turned over the active details of the business to my younger brother and other younger associates in the business. I am enjoying this civic work very much and think I can be of some service to the community. I have always felt that one who could afford to ought to give some civic service during his lifetime and this seems to be my opportunity. Fortunately I was elected as an Independent and I am not tied to any of the political bosses." We are certainly glad to know that the extensive Merrell laboratories are safe and did not suffer the fate of the Crosley Warehouses. County Commissioner Merrell is a fine example of a man with a technical education in an important political office where he can use his success-

ful business experience for the benefit of the county. We wish some Massachusetts counties we know of could have such a commissioner. We hope Merrell's hard work is appreciated.

A recent issue of the *Boston Herald* contained a fine portrait of Ned Webster with the following statement in regard to his various activities: "Mr. Edwin S. Webster is the president of the Massachusetts Horticultural Society which each year transforms the drabness of cavernous Mechanics Building into floral enchantment. With Mrs. Webster, he is a leader in American horticultural movements, and their gardens and greenhouses contain, in addition to other rare plants and flowers, orchids acclaimed by connoisseurs of these exotics. Residing on Hammond Street, Chestnut Hill, in the winter, their summer estate on Quisset Harbor, in Falmouth, has extremely beautiful rose gardens. He was the organizer with Mr. Charles A. Stone of New York of the great firm, Stone and Webster, and is a life member of the Corporation of the M.I.T. He is also a trustee of the Museum of Fine Arts and, well acquainted with Japan through his extensive travel, was appointed honorary Japanese consul at Boston. He is also the owner of a fine collection of prints of Old Boston."

A close personal friend of Mrs. William Gage Snow, widow of our Class Secretary for 33 years prior to 1930, advises us that Mrs. Snow is passing the winter, as usual, at Sarasota, Fla., where, on account of the extremely hot weather, she spends most of her time on the beach and in her car, accompanied by her daughter, Eleanor, and her two sons.—Samuel Otis Dauchy, President, Dauchy Iron Works, Chicago, Ill., has recently removed to 4455 Hermosa Way, San Diego, Calif. You may remember that Dauchy joined us as a graduate student in our senior year. We hope to hear from him soon so that we can give you some details of his activities during the last 49 years since we saw him in the classrooms of old Rogers Building.

Recently I called on Sylvanus Hale Cobb and found him on the 20th floor of the United Shoe Machinery Corporation Building, 140 Federal Street, Boston. He was an "electrical" and in the Nineties was an assistant examiner in the United States Patent Office and while in Washington lived with Edward Collins, Jr., who held the same kind of job. Some time after returning to Boston he was a solicitor of patents for the American Telephone and Telegraph Company, but when they moved to New York he refused to desert Boston and so joined the United Shoe and is now the solicitor of patents for this great corporation with an exclusive office on the top floor of their skyscraper.—Our classmates seem to prefer offices on 20th floors, for the next man I called on was Charles Goodnow Rice of the N. W. Rice Company with offices on the 20th floor of the Second National Bank Building, 75 Federal Street, Boston. I do not remember Rice, for the last time I saw him was 52 years ago, in 1885, as he left us to go into business with his father

after his freshman year. I found that he had retired from active business and is now living quietly in Ipswich, Mass.

Walter Everett Silsbee was unique in that he was the only member of the Class who took two courses during the three years he was with us; he took both civil and mechanical engineering. He practiced civil engineering in Lynn, Boston, Waltham, and Cambridge. He was with H. S. Adams, civil engineer, Ames Building, Boston, for a long period of years, and later formed a partnership with G. S. Gould '07. He has recently retired from active business. His home is at 59 Magazine Street, Cambridge, Mass. The crowning work of his career was done at the time of the World War in connection with the water front of Rockport, Mass. It included the breakwater in front of the inner harbor with various granite docks and other improvements—all of which did great credit to his engineering ability.

Ellison Cooke Means, President, Means Realty Company, Ashland, Ky., fortunately built his home 15 feet above the record high-water crest of 73.8 feet for the Ohio River at Ashland during the January flood. The normal water level is less than 14 feet, the flood causing an increase in level of over 60 feet. Although one of the highest points between Pittsburgh and Cairo, the main business district was inundated halfway to the ceilings of the ground floors of office buildings. The property damage of over a million and a third was light compared with other Ohio Valley cities. Ashland's two major industrial plants, "Armco" and "Solvay," were flooded and closed, throwing most of the city's wage earners out of work. Means states that the greatest accomplishment during the flood was the manner in which water, electricity, gas, and telephone services were rendered. He was the builder of the city water system which was designed for a crest three feet higher than the previous high mark, but the new mark was six feet higher than the old, so he says it took heroic work to keep the plant in operation. Means's company's property was above high-water mark, except a garage and filling station, but his son had several dwellings from which the tenants were driven. Only about 20% of the dwellings of Ashland were reached by the flood, the rest having been built on higher land. We congratulate Means on his escape from the flood with so little loss. The Christmas season was passed by Mr. and Mrs. Means at Lakeland, Fla., with their two children, two grandchildren, and two in-laws. It was the first time for 16 years that their children were with them on Christmas day. One family flew from Texas to Florida to gain an additional day with them.

Wilson Boyden Parker, one of the most distinguished architects in the Central States, passed away on January 6 at his home in Indianapolis, Ind. He had been failing in health for some time. He was born in Natick, Mass., a son of the Rev. and Mrs. Addison Parker. After attending Morristown School and Peddie School in northern New Jersey, he entered Tech-

1888 Continued

nology with our Class. After leaving Tech he was with McKim, Mead and White, architects, New York City, for three years, then two years with John DuFais, architect, New York City, practiced a year in Somerville, N. J., and then removed to South Bend, Ind., in 1892, forming a partnership with E. R. Austin, Cornell '86. This firm continued till 1900, during which time some of South Bend's best structures were erected under their supervision. Among these were St. James Church, Chamber of Commerce, Epworth Hospital, St. Joseph County Savings Bank Building, and the first group of buildings for the Singer Manufacturing Company. Parker was active in the Indiana Association of the M.I.T. and at one time was elected president for two years. He went abroad in 1898, visiting Holland, Belgium, Germany, France, and England. In 1903 he moved to Indianapolis, which was his home for the rest of his life. During the World War he served with the War Department in Washington. His professional work embraced much hospital and school work, over 30 public libraries, and much residential work. His largest commission was the Insane Hospital at North Madison, Ind., a group of 32 buildings. The Indianapolis Y.M.C.A., Terre Haute Y.W.C.A., and several country clubs can be numbered in the list. From 1920 to 1923 he designed over 50 churches. In 1920, he was married to Miss Laura Mahan of Toledo, Ohio, who survives him. He was president of the Architects Club of Indiana, Indianapolis Architects Association, and Indiana Artists Club and a member of the University, Columbia, and Hoosier Athletic Clubs and also a member of the board of the Mendelssohn Choir. He will long be remembered in the hearts of his friends. — BERTRAND R. T. COLLINS, *Secretary*, 72 Oxford Road, Newton Centre, Mass.

1890

The Review's requirement that class notes shall be submitted 40 days before publication ensures that no one who reads this will have failed to learn of the loss on January 8 of our President, Charles Hayden. There is no need to repeat here the story of his life. An officer and director in 58 corporations, he made effective use of his Technology education. Deriving much of his earlier success from association with mining enterprises, he showed his appreciation by providing, with Coleman du Pont '84 and a few others, for the erection of the mining wing of the new Technology, which he insisted should be of ample size to take care of future growth. His further appreciation is shown by the gift of a million dollars to Technology in his will. None of us can fail to feel a thrill of pride in the use he has directed for his fortune, with the object of rearing "a nobler race of men who will make better and more enlightened citizens, to the ultimate benefit of mankind." We of '90 who have often enjoyed his hospitality at our dinners and on his yacht will much miss his cordial salutations.

Samuel D. Flood died of a heart attack at his home in Kenilworth, Ill., on January 10. After college, he was a consulting engineer. In the Spanish-American War he served with the rank of ensign. Later he pursued his vocation as a consulting engineer until 1916 when he established his own firm, the Flood Doorless Oven, whose product he invented and patented himself. Retiring about 1929, he traveled a great deal. He is survived by his widow, Edna Boal Flood, and two children: one daughter, Mrs. Robert H. Gardner of Winnetka, Ill., and one son, Douglas Flood, Jr., who is in the United States Diplomatic Corps and is now vice-consul at Barcelona, Spain. An old friend, Lonsdale Green '87, writes: "Twenty or 30 years ago Flood was very loyal about attending Tech meetings, and in the decade from 1920 to 1930 played golf. — He was a likeable man and a genial companion."

Franklin Knight is to retire in June from the Episcopal ministry, to which he was ordained in 1896 after preparing at the Berkeley Theological School. He writes: "You know, very likely, that I was the first man who ever went into the ministry from M.I.T. I wonder if it should be considered an honor or a disgrace that the Class of '90 should have supplied the first man to make a defection from the ranks of science to those of theology. But at least I have not been the only one. There have been several since, and at one time in this Episcopal diocese of western Massachusetts, there were three graduates of Technology among its ministers: Willard Roots of the General Course, Donald N. Alexander '98 of the Course in Architecture, and myself. Alexander and I are still here, and both on its board of missions. After ministries in Colorado City, Colo., Lynn, Mass., Dalton, Mass., and New Haven, Conn., I came here to Holyoke, and when I shall leave here on June 30, I shall have been here almost 26 years. My wife is still living, and we have four children, three boys and one girl . . . my oldest son, head of the aviation department at Georgia School of Technology (himself a '22 graduate of M.I.T.), my daughter, the wife of a successful physician in Salem, Mass., my second son, an inspector with the Zurich Insurance Company in its New York office, and my youngest son, unmarried, in social settlement work in Boston. And I have five grandchildren. In June I expect to retire to Great Barrington, Mass., where I shall try still to be a useful man, though with a more leisurely tempo. I have had no time for hobbies, but may yet develop one. I am fond of carpentry and have done much in the past and expect to do much in the future in improving the old house we have bought and expect to live in at Great Barrington. My life has not been a greatly checkered one, but my fellow citizens here have amply testified of late that it has been a useful one, for which testimony I am glad as I got out of it."

Pierre du Pont, who has often been a public benefactor in the past, is reported as giving his "employees of the Long-

wood Farms" \$200,000 in preferred stock of the Du Pont Company, as a gift which he advised them to place in irrevocable trust to provide necessities in their old age. This gift was made only to employees who have served for ten years or more, each one receiving two shares for each year in service. The first dividend, shortly after Christmas, brought approximately \$35 a share, so that some of the employees received more than \$1,000.

W. Z. Ripley is reported in the papers as saying: "In President Franklin D. Roosevelt the people of the United States have the best man available at the helm guiding their destinies." Ten years ago Ripley wrote "Main Street and Wall Street," a book in which he stated that conditions throughout the country were on an uncertain footing, and he prophesied trouble. During the years of the depression he saw most of his predictions come true, and three security and exchange statutes were enacted by the recent Congress practically putting into law his recommendations. He sailed for Bermuda recently where it is reported he will spend three months bringing his book up to date.

Notice: The class by-laws state that '90 shall have a president and a secretary. Within the past year we have lost both. Harry Goodwin suggests that a meeting be called for the election of new officers, and that this meeting be held around five o'clock on the afternoon of the next M.I.T. annual dinner at the Commencement in June. You will receive a notice. Plan to be there. — GEORGE A. PACKARD, *Acting Secretary*, 50 Congress Street, Boston, Mass.

1892

John W. Hall, Secretary, sent out the first of three notices to call your attention to the class reunion at Billy Kales's place at Harwichport on the Cape. Provisionally, the plan proposes our arrival at Harwichport, Friday, June 4, spending two nights including all of Saturday and part of Sunday, returning to Boston in time for participation in the general reunion at Cambridge on Monday, June 7, and graduation, Tuesday, June 8. This will celebrate our 45th reunion.

Arthur W. Dean of Boston, chief engineer of the Massachusetts planning board, was elected a national director of the American Society of Civil Engineers and took office at the 84th annual meeting in New York City, January 20. His career includes periods of service as city engineer of Nashua, N. H., electric railway engineering in New Hampshire and Massachusetts, and state highway engineer of New Hampshire. He is a past president of the American Road Builders Association and the Boston Society of Civil Engineers.

Herbert G. Fairfield, I, has been elected president of the Boston Association of Casualty Insurance General Agents. — Mary Lovering Holman is the author of the "William Sherman Genealogy" which came off the press on December 24. It is a book of 530 pages and its preparation occupied part of her time for ten years. William Sherman settled in

1892 Continued

Marshfield in 1640 but was in Plymouth as early as 1632. Compilation was made from original records and more recent accounts from data furnished by descendants. — JOHN W. HALL, *Secretary*, 8 Hillside Street, Roxbury, Mass. W. SPENCER HUTCHINSON, *Assistant Secretary*, Room 6-201, M.I.T., Cambridge, Mass.

1895

We give here the report promised in the last issue about the death of John Herbert Gregory — who passed away at his home in Baltimore, Monday evening, January 18, after one hour of intense suffering from coronary thrombosis. When stricken, John was packing his bag preparatory to going to New York the next day to attend the annual meeting of the American Society of Civil Engineers.

He was born in Cambridge, Mass., and after graduation from M.I.T., his first work was with the Boston Metropolitan Sewerage Works. Subsequently he served sewer, sanitary, and water-purification organizations in upward of 100 cities and towns in the United States: Albany, Philadelphia, Jersey City, New York City, Newark, Columbus, Chicago, Baltimore, District of Columbia, Detroit, and Montreal, Canada. In 1919 John joined the faculty of the school of engineering at Johns Hopkins University and was appointed professor of civil and sanitary engineering. He also occupied a chair in the school of hygiene and public health. He served the city of Baltimore as consulting engineer on many commissions. In his dual capacity of teacher and consultant, his was a strenuous life traveling hundreds of miles each week.

Gregory was a life member of the American Society of Civil Engineers. He was also a member of the American Society for Testing Materials, American Public Health Association, American Society of Municipal Engineers, American Water Works Association, New England Water Works Association, California Sewerage Works Association, Maryland-Delaware Water and Sewerage Association, Boston Society of Civil Engineers, Engineers Club of Baltimore, and of the Society of the Sigma Xi. In 1924 he was made an honorary member of Tau Beta Pi.

As a reviewer of technical books, especially in the fields of hydraulics and sanitary engineering, he is widely known. In the last 20 years most of the new books published in the United States and dealing with these subjects have been reviewed by him. At the request of John Wiley and Sons, Inc., publishers, he wrote a brief article for the Wiley bulletin of May, 1935, entitled "The Review of Technical Books," in which he set forth the underlying principles to be followed in the review of such books. As an author John wrote upward of 80 technical and other papers, articles, and discussions, short and long, dealing mainly with sanitary engineering and hydraulics.

In 1910 he was awarded the Thomas Fitch Rowland Prize by the American Society of Civil Engineers for his paper entitled "The Improved Water and

Sewage Works of Columbus, Ohio"; in 1930, in conjunction with C. B. Hoover and C. B. Cornell, he was awarded the James Laurie Prize by the same society for a paper entitled "The O'Shaughnessy Dam and Reservoir"; and in 1936 in collaboration with the late R. H. Simpson, Orris Bonney, and Robert A. Altion, he was awarded the Rudolph Hering Medal, also by the same society, for a paper entitled "Intercepting Sewers and Storm Stand-By Tanks at Columbus, Ohio." All of the papers for which these awards were made have had to do with important advances in the art of sanitary engineering. The city of Columbus has long been a leader in important advances in the art of sanitary engineering, and John's connection with these advances is well known. In the summer of 1935 he finished a very attractive summer home on the ocean bluff at Harwichport, Mass. The sympathy of the Class is extended to Mrs. Gregory and to their son, Richard Sears Gregory³⁴.

Another beloved classmate — Richard Baxter Brown — passed away at his home in Plymouth, Mass., February 2, after an illness of less than a week. Richard was born in Duxbury, Mass., in 1873, and was known and highly regarded by persons in every walk of life in the community of Plymouth. He was associated with the Plymouth Cordage Company for 45 years. He was leader of the Plymouth Men's Glee Club, the Christ Episcopal Church Choir, the Plymouth Cordage and Pilgrim Band, and was secretary of the Musicians Union. While at Tech he was leader of the Drum Corps. He is pleasantly remembered by the Class as having furnished the music at the 35th reunion at the Mayflower Inn, Plymouth, Mass. Besides his wife, Mrs. Margaret Errington Brown, he leaves ten children, five brothers, two sisters, and 13 grandchildren.

Fred W. Draper has apparently benefited from our paternal government in Washington, as it is announced that he was recently granted a \$20,000 Class B loan for the development of the Red Banks Quartz Lode Mine, and Draper is now making his headquarters at the property which is located at Bagby, Mariposa County, Calif.

Anyone wishing to communicate with the following members of the Class, will be glad to know their new addresses: Dr. E. Morton Chapman, Pelham Courts, Washington, D. C.; Professor Charles E. Littlefield, 3630 Northwest 22d Court, Miami, Fla.; Frederick A. Woods, care of Hotel Boston, Rome, Italy. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass. JOHN H. GARDINER, *Assistant Secretary*, 420 Lexington Avenue, New York, N. Y.

1896

Hats off to Bakenhus who becomes younger and more active as time goes on. One of his hobbies, in addition to fencing, is music. It is surprising that after being without a piano for about 20 years in the Navy, he took up piano music again when he became a member of the Naval War College staff at Newport, R. I., taking

instruction under Stuart Mason of the New England Conservatory in Boston. He was an excellent pianist before he entered M.I.T. and now he is back to his old form with the result that on Monday, February 1, he was on the air from Station WEAF in New York, from 6:35 to 6:45 p.m. The announcer paid fine compliment to Bakenhus on that occasion, pointing out that in his early boyhood he had learned to play the reed organ and that it was a rare privilege to present an informal recital of piano music from a rear admiral of the United States Navy. The Class also was honored when the announcer stated that it had contained three rear admirals in the United States Navy. His program included "Raindrop Prelude" by Chopin and "Etude VI" by Schytte.

Another of the admiral's avocations is the increase in activity of the Class of '96 primarily among those members near New York, but going farther afield at times. His earlier gathering of '96 Tech men at the New York Athletic Club has been reported previously. It was so successful that when the admiral learned that the Secretary would be in New York attending the convention of the American Institute of Mining and Metallurgical Engineers, he immediately started plans for another get-together, with the result that 10 men sat down to dinner at the New York Athletic Club, 59th Street and 7th Avenue, at 7 p.m. on Tuesday, February 16. Those present were: Bakenhus, Gaylord Hall, Jim Melliush, Lou Morse, Ruckgaber, Sager, Ed Sturtevant, John Tilley, Charlie Trout, and the Secretary. It was a rare occasion for the Secretary to look upon faces which he had not seen for years and years. It is to be hoped that Bakenhus may be able to continue his success and after having lured men like Sturtevant, Ruckgaber, Sager, and Trout as far as the New York Athletic Club, he may ultimately prevail upon them to attend a five-year class reunion and perhaps even appear at an Alumni Day in June in Cambridge. It was hoped that Rockwell might be present at this New York gathering but he could not get away from Cambridge. Morse was present because he happened to have a call which brought him to New York at that time from York, Pa. Charlie Lawrence, who had attended last time, sent his felicitations and regretted that it was out of the question for him to leave Baldwinville, N. Y. Calvin Crocker wrote from Biloxi, Miss., where he was spending the winter. Now that he is retired, he maintains his old mailing address in Connecticut but actually spends summers in Maine, winters in the South, and only a part of spring and fall in South Norwalk. He feels that after 30 years trying to keep New York honest and fair he was entitled to his retirement two years ago and is now enjoying a peaceful old (*sic!*) age, free from politicians trying to put him in bad or make him a goat. Harold Stevens and Louis Freedman had both hoped to be present but found that complications arose at the last minute that kept them away, much to the disappointment of the

Secretary because he had not seen Stevens for about a quarter of a century and Freedman for an even longer period.

After the dinner the meeting adjourned to a corner of the lounge where all sorts of topics were discussed until nearly the hour of midnight. John Tilley was in his usual good form and reported some of his bricklaying experiences; Charlie Trout now has three jobs, which seem to be necessary in order to provide sufficient income; Sturtevant is in the Bird's Eye organization; Sager is continuing his successful patent-law practice in New York; and Ruckgaber is retired. Perhaps the fact that he has remained a bachelor accounts for his ability to retire. He contemplates a European trip this coming summer. Although not at the dinner, another '96 man met by the Secretary in New York was Bradley Stoughton, dean at Lehigh University. Bradley reported that he had not burnt his house down recently, as once occurred. He finds that his job of dean calls for a lot of time for administration and a sacrifice of his teaching work and he is looking forward to possible retirement from teaching in a few years, but by no means retirement from active work in metallurgy.

Three additional installments of the Fuller travelogue have been received. When last reported in these columns the Fullers were at Manila and, having two days available after their cruise in the Southern Philippines, they spent the time on drives to points of interest, including a rather wet river trip through rapids in native dugouts. They sailed from Manila on December 9 and three days later were in Saigon, French Indo-China, where they took an automobile for a five-day trip of 555 miles to the frontier of Siam, passing through Phnom Penh, Siemreap, and the famous ruins of Angkor Wat. It was at this place that they had their first elephant ride, sitting in a howdah, which they described as being worse than anything ever tried except the cushionless and springless Peking carts. In Siam they had a three-day wait, which they spent in land and water trips around Bangkok. From Bangkok to Singapore was one thousand miles, which they made by train, seeing something of the tin mines, the jungles, the rubber plantations, and other industries. The train stops overnight, so that they reached Singapore on December 22. This is described as a modern city, with little evidence today of its traditional wickedness of years gone by. At Singapore the Fullers found that they would have to wait five weeks for the steamer which they desired to take to Australia, and their first trip was to the Island of Sumatra. Christmas day found them on board ship and for the first time in many years, no matter where they happened to be, the Christmas dinner did not include turkey, and they had to be satisfied with duck. They were able to take an automobile trip in Sumatra and on December 29 they were back in Singapore preparing for a trip to Borneo.

It is with regret that the Secretary reports the death of Alf Lootz, which occurred on Sunday, February 21, at the

Massachusetts General Hospital after a brief illness. Lootz was born, March 8, 1870, in Boston, the son of Gjert Lootz. His father was Norwegian consul in Boston for many years. He married, June, 1898, Miss Ada M. Brown, who survives him, as does a son, Alf C. Lootz, Jr., of Kingston, who was born in May, 1899. Prior to entering M.I.T. he spent four years on a ranch in the West and after graduation he returned to the West. In 1904 he was with the United States Reclamation Service at Reno, Nev., and again in 1912 he was with the United States Reclamation Service. His main work, however, was in construction. In 1906 he was superintendent of construction for Holbrook, Cabot and Rollins, and many jobs were successfully completed under his care, such as the Charles River Dam, the John Hancock Building, the National Shawmut Bank, the dry dock at the Charlestown Navy Yard, the fireproofing of the Bulfinch Building, and other enterprises as far afield as California, Puerto Rico, and numerous other places. However, for a long period he had been associated with the Massachusetts General Hospital as superintendent of works. Lootz will be remembered, especially by his classmates in Course I, as a big, powerful, pleasant individual, although somewhat retiring. This retiring nature became more pronounced as far as M.I.T. was concerned as years went on, with the result that Lootz was seen only by chance by his classmates, and, as far as known, never appeared at any Technology or class gatherings.

At the time these notes are being written — the latter part of February — Rockwell has just received word from Joe Driscoll to the effect that Joe has landed in Pinehurst, N. C., for his annual spring golf training, and he has found that the Carolina Pinehurst Golf Course is, in his opinion, the finest in the world. Numbers 1 and 2 are now perfect grass greens; Number 3 is still in process of improvement.

Billy Anderson was in Boston for a week or two during the early part of February. His objectives were: medical care for Mrs. Anderson, a visit to their son, who is attending Harvard University, and genealogical study by Billy himself. Unfortunately Billy was laid low by a germ and spent the first week or ten days of his visit in his room at the Copley Plaza, but later was able to follow his hobby of genealogy in the genealogical rooms on Beacon Hill where he spent much of his waking hours. He is following up both his father's and his mother's families and already has published one pamphlet on the family history. His son's marriage is scheduled for June to a young lady in Cincinnati. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M.I.T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

1898

We were looking over the records of the proceedings of the American Association for the Advancement of Science at

their meeting at Atlantic City last January, and we note that the report on the sessions of the subsection in aeronautics of the section on engineering was written by Lester Gardner. — We recently came across a short scientific note written by Percy A. Campbell, entitled "Cosmic Rays and Light," in which an ingenious explanation of the red shift of the spectrum of the distant nebulae is offered in place of the expanding-universe theory. Campbell is research engineer of the General Electric Company at their Nela Park laboratories in Cleveland. He is author of "Generation of the Universe and Design for Living," and so on.

We cut the following paragraph from a long account of the cruiser race won by Paul Johnson, published in the *Pacific Skipper* of October: "Captain Paul Franklin Johnson's 107-foot, twin-screw Diesel cruiser, *Seyelyn II*, flagship of the Balboa Yacht Club, won the 374-mile ocean race from Long Beach to San Francisco, starting from the former port the morning of September 10 and finishing at the northern port at noon on September 13. As a fitting reward for her performance, *Seyelyn II* obtained a leg on the famous Hall-Scott Trophy for over-all leadership, as well as a beautiful, large silver tray known as the Marine Office of America Over All Trophy." Not without interest is an advertisement in the same journal, which we copy, except for the display type: "A real logbook for your motor yacht, used by all entires in Long Beach-to-San Francisco Race, provides for weather, vessels passed, courses steered, leeway drift, distance run, time required to run courses. An exact log for your ship is easy to keep with Captain Johnson's Motor Yacht Log Book . . . only \$3.00 postpaid direct or at all dealers. For sample sheet send to Captain Paul F. Johnson, Johnson Motor Yacht Log Books, 3100 Maiden Lane, Altadena, Calif."

Harold Jones has returned to this country, his address now being: Colonel Harold W. Jones, War Department, Army Medical Library, 7th Street and Independence Avenue, Southwest, Washington, D. C. It will be remembered that during the World War he commanded a large hospital base in France. Since then, until this most recent move, he has been engaged in operative surgery at Fort Sam Houston (Texas), the Philippines, and other places. In 1933 he was ordered to Honolulu to command the Army General Hospital there. In the spring of 1936, following the death of his wife, he returned to the mainland, marking time until his recent appointment at the Army Medical Library. First and last he has been quite a writer; we remember several medical papers and writings about travels in Asia made between his army assignments, travels in which he studied the anthropology and social customs of the races. Some of his more recent writings have been "The Surgeon General's Library and the Romance of the Index Catalogue," "The Army Medical Library in Relation to the Nursing Profession," "The Greetings from Beyond the Seas,"

1898 Continued

"A Gallery of American Physicians," "The Artistry of Sir Charles Bell." He says of himself that he is in perfect health and imagines he could put the shot at least 20 feet, but he knows better than to try.

Frederick C. Gilbert, metallurgical engineer, is secretary of the Mining Association of Montana. He represented Montanan interests at the recent convention of the American Institute of Mining and Metallurgical Engineers in New York.

All classmates must keep in mind our 40-year reunion in the spring of 1938, which is only a little more than a year ahead. The immediate concern is for everyone to have his affairs so arranged that he can attend. All wishes or suggestions about the reunion will be welcome to the committee, which consists of Lester Gardner and George Treat. — ARTHUR A. BLANCHARD, *Secretary*, Room 4-154, M.I.T., Cambridge, Mass.

1901

The air is so full of gasoline and other things that a nice horse-and-buggy ride in the country might prove rather refreshing after all. Furthermore, if the future is to be safeguarded, budgets must be kept in balance and your Secretary is, therefore, glad to advise that with careful economy the funds in the class treasury should carry through until June, which is the end of our fiscal year, and allow a small balance at that time. Nevertheless, it is most desirable to accumulate a larger surplus, and the large number of members who *have not* sent in their modest class dues are invited to join the small number who *have* already contributed to the modest expenses of the Class. The latter in most instances have also sent in some brief news regarding themselves or at least have sent their latest addresses. William G. Blauvelt gave his address as Hingham, Mass., and noted that he was retired. Since his data sheet was received, notice has come from the Alumni Association that he is now located at 246½ Seventh Avenue, Northeast, St. Petersburg, Fla. Possibly, therefore, when more of the Class are so fortunate as to be able to retire and can migrate to Florida, we can join in a very interesting community at some such point as St. Petersburg.

Charles I. Auer, who is now located at 1012 Park Road, El Paso, Texas, gave somewhat further information, stating that his present occupation is mining engineer, metallurgical chemist, and businessman, and that he had been promoted to lieutenant colonel in the Chemical Warfare Service, Organized Reserve Officers Corps of the United States. He also mentioned the important fact that he has one grandson who is steadily pushing his way toward M.I.T. — C. Franklin Willard phoned in from Groton, Conn., where he has a law office (rather far separated from the Course of Naval Architecture but, of course, the law requires a knowledge of many subjects), stating that he was might sorry that he could not

attend the 35th reunion but hopes to meet the boys at the Alumni Day banquet in June, and from comments received from others it would now appear that a good crowd should reunite at that time. — Frank B. Walker, who is chief engineer of the Eastern Massachusetts Street Railway Company, 38 Chauncy Street, Boston, advised that he was very sorry to have missed the reunion because of sickness and that he did not get back to work until the latter part of September. I know that he wanted to attend the reunion, so certainly hope that he will be more fortunate in the future. I hope to have a chance to have a visit with him when next in Boston.

Paul Hilken (National Unit Corporation, 420 Lexington Avenue, New York City) wrote that Russell Henry Glover — known to his friends as Rusty — who had somehow escaped meeting Paul during the last 35 years, called at his office last fall and had changed very little, being the same jolly Rus we knew of old. He spends six months of each year at Harrington, Maine, and the rest of the time in New York, dabbling in real estate. Paul says that Rusty (whose New York address is 2326 28th Street, Astoria, Long Island) is offering Maine farms at bargain prices and that he is sorely tempted to leave the hustle and bustle of New York for the quiet of a landed gentleman in Maine. Perhaps, therefore, when more of us retire we might decide to go to Maine instead of Florida. Paul also stated that shortly after his return from our 35th reunion at Oyster Harbors, and also after a lapse of 35 years, he wrote Stanley Sears (he did not give Sears's address but the class records show it to be with the valuation division of the Internal Revenue Department, Washington, D. C.) and he enclosed a copy of Stanley's reply which would indicate that he was retaining his slim, girlish figure, that he still enjoys golf just as much as ever and plays about like the rest of us, that he has a wife and daughter, and that he would study over Paul's suggestion of a get-together sometime. Paul has, therefore, been doing his part to renew contacts with other members of the Class and has more recently written me that he saw Asher Weil not long ago and suggested that it would be a good idea to get the members of 1901 living in New York and vicinity to join at a luncheon at the Technology Club. Unfortunately, I have not had occasion to go to New York recently but hope that I may so arrange shortly and can make a special report of the planned luncheon.

Several interesting communications have been received from our new Vice-president, Joe Evans, who is state engineer inspector, PWA, for the states of South Dakota and Nebraska. Joe states that while the PWA construction projects are not nearly so numerous as they were, several large hydroelectric and irrigation developments are still under way, and that he usually travels between 2,500 and 3,500 miles by automobile every month throughout the state of Nebraska. However, his official address still remains 515

Federal Office Building, Omaha, Neb. Joe made a visit to New York at Christmas time and stopped at the Technology Club, and I was mighty sorry not to be able to go down and have a visit with him.

Horace E. Hildreth of 6 Linnaean Street, Cambridge, Mass., is now a consulting engineer, and advises that his recent work is mostly on heating and temperature regulation, and that he has three children, two of whom are now in retail business and the third is still in school. — Ed Seaver sent in a cheerful "hello" and gave his residence address as 166 Fair Oaks Park, Needham, Mass. His business position is New England manager of the Foster Wheeler Corporation at 80 Federal Street, Boston, and I know that Ed would be glad to see any of the fellows who can find time to call on him at either address. — Bill Sturtevant is assistant manager of the Blackstone Valley Gas and Electric Company, 55 High Street, Pawtucket, R. I. His residence address, Louisquiset Pike, Saylesville, R. I., is phonetically very attractive, and I have an idea that if any of the fellows called on him, he would be delighted to see them and that they would find his place just as attractive socially as it sounds phonetically.

Two 1901 men, namely, Al Sulzer and Charlie Flint, hold very important executive positions with the Eastman Kodak Company, Rochester, N. Y. Al's data sheet very briefly states that he is vice-president, director, and assistant general manager of the Eastman Kodak Company, but I have not heard from Charlie Flint and would very much appreciate a word from him so that I may chronicle just what he does at Kodak Park. I certainly hope that, while their business continues prosperous, their responsibilities will not again prevent them from attending our next reunion. — Harry B. Chalmers, who started with 1900 but ultimately showed his good judgment by finishing with 1901 and whom we were all mighty glad to see at the reunion last June, advises his present occupation somewhat cryptically as follows: "Inventing — details, undivulgable — also director of Jaray Streamline Corporation of America." He did not happen to tell me of those interests at the reunion as I was too busy playing golf and he was too busy elsewhere; consequently, I hope to see him sometime when in New York (he lives out at 51 Park Avenue, Babylon, N. Y., and I think his New York City address is 22 East 38th Street). I might add that I would like to see his sextuplets; on his data sheet he gave me quite a shock (he said he had drowned three) until I read to the end and found that he was referring to wire-haired fox terriers.

Allen McDaniel, who gives his address as 7 Grafton Street, Chevy Chase, Md., states that he is director and consulting engineer, The Research Service, and that he has been engaged as a consultant on the drainage basin study of the National Resources Committee, which will result in a report to the President and the Con-

1901 Continued

gress on water, use and control of the rivers of the entire United States; consequently, in view of the recent disastrous floods, this report should prove most important and, as stated by Allen, should allow the working out of a comprehensive and coordinated plan for the utilization, conservation, and control of the water resources of the country. It would, therefore, appear that, as soon as Joe Evans has finished his present work in Nebraska, he will have plenty to do in taking charge of other similar projects. — Arch Klieves gave only his address on his data sheet (Post Office Box 232, Wheeling, W. Va.), but I believe that he still continues in the same fortunate position he had last year: a retired gentleman. He should, therefore, have attended the reunion, and we certainly hope that he can be present on the next occasion. Charlie Tufts, who was at the reunion last year and whose address I believe continues as 61 Broadway, New York City, has written me a very cordial note and suggested a luncheon when I am next in the city. Unfortunately, as noted above, I have not been there recently but hope to go soon and trust that a number of us can get together. See Paul Hilken's suggestion mentioned above. — ROGER W. WIGHT, *Secretary*, 700 Main Street, Hartford, Conn. WILLARD W. DOW, *Assistant Secretary*, 20 Beacon Street, Boston, Mass.

1902

Charlie Mac — excuse us — Colonel Charles E. McCarthy wrote from Fort Douglas, Utah: "Mendenhall is the first '02 man that I've seen for years, since I used to see Lockett and Grant in Washington in 1918 and 1919. It was mighty nice to find a classmate and do a little fanning about the old gang. I've just settled down to being an 'Old Sojer.' I like it and am thoroughly happy. At the end of the War I intended to stay in the service only until the prices of base metals came back and then to return to my private practice in Nevada, but the prices never came back and here I am and here I'll stay till they file me away in the archives. Outside of a trick at Fort Benning, Ga., and one at Fort Leavenworth, Kansas, most of my service since 1920 has been near the Pacific: Arizona, Panama, Presidio at San Francisco, Fort McDowell (Ariz.), and Sacramento. Did over two years with the CCC, practically all of the time commanding the Sacramento district. That was a great experience; ask Borden — he knows.

"Am sitting in a nice spot here, but the War Department has seen fit to make a brass hat out of me, assign me to the General Staff, and ship me to the Philippines. We sail from San Francisco, April 9. Don't know yet whether I go to department headquarters at Manila or to division headquarters at Fort William McKinley (six miles from Manila). Am mighty sorry to have to miss that reunion. We'll have to call it 'exigencies of the service.' Have placed the dates on my calendar and will be hoisting one for you all at the Army and Navy Club at Manila on those days. Tell the gang, if any of

them are making trips to the Orient, to ask for me at the Army and Navy Club at Manila."

Arthur Sawyer wrote from Vancouver: "Last August my work in Denver was drawing to a close and the interests for whom I have been working sent me up here to take charge of the Surf Inlet Consolidated Gold Mines. Mrs. Sawyer and I arrived in Vancouver about the first of September and I spent a month studying the proposition. This included a trip to the mine which is located on Princess Royal Island, about 400 miles northwest of here. On the first of October they made me president and treasurer of the outfit, and, as you may well imagine, I have been very busy since." Sawyer's address is 611 Pacific Building, 744 West Hastings Street, Vancouver, B. C. He will have to make a trip East some time this year and is trying to include the reunion in June.

Mud Comins is located at Potosi, Mo., with the pigments and chemical division of the National Lead Company. Comins has been at St. Francois, Mo., with the same company for many years. — George Seabury wrote that he is working out his program as secretary of the American Society of Civil Engineers in such a way as to be on hand at Oyster Harbors in June. — Adrian Sawyer has returned from his trip to California via the Canal. He reported a fine trip and has gathered his second wind as chairman for the reunion next June. He found more winter in southern California than in Boston this year and found eight feet of snow in Yosemite. Between trains in Chicago he talked with Ken Lockett, who is supervising PWA work in 17 counties in Illinois. Ken is coming in June to find out if his fellow members on the reunion committee really look as tough as their pictures in the recent *Report*. — FREDERICK H. HUNTER, *Secretary*, Box 11, West Roxbury, Mass. BURTON G. PHILBRICK, *Assistant Secretary*, 246 Stuart Street, Boston, Mass.

1904

In order to maintain my property rights in this space in the class notes I offer the following small amount of information regarding class members: Ed Parker, President of the First National Bank of Reading, accompanied by Mrs. Parker spent his winter vacation in the month of February in St. Petersburg, Fla. I received a post card from Ed which rather indicates that he enjoyed himself very much. — Don Galusha spent most of the winter in Sherwood Sanatorium, St. Albans, Vt., recuperating from a heart attack. As these notes are written, it is reported that he is making very satisfactory progress. — On January 13 Phil Sweetser paid one of his rapid visits to Boston but was here long enough so that Mert Emerson, Gus Munster, Gene Russell, and I had lunch with him at the University Club, which was much enjoyed by all of us.

The annual reunion of the Class will be held at East Bay Lodge, Osterville, Mass., June 25, 26, and 27. Full details of the event will be in your hands in a short

time. — That's all there is; there isn't any more! — HENRY W. STEVENS, *Secretary*, 12 Garrison Street, Chestnut Hill, Mass. AMASA M. HOLCOMBE, *Assistant Secretary*, 8 Rosemary Street, Chevy Chase, Md.

1905

The 1905 midwinter get-together held at Walker Memorial on Tuesday evening, February 9, hit a new high both as to attendance and enthusiasm. Although called on short notice, 21 men responded, including such old (soft pedal on the adjective) regulars as Boggs, Barrier, Tower, Files, Donald, Marcy, Wentworth, Kenway, Charlie Johnson, Gilman, Fisher, Strickland, Buff, and Goldthwait. Fred Pirie rumbled in on the Narrow Gauge from Nahant, Professor Cowdrey taxied over from Engineering A (or whatever they now call it), and Bob McLean of Carver cotton gin fame jitneyed up from Bridgewater. The prize for coming the longest distance was contested by Carl Graesser (By-the-Sound) and Prince Crowell, but as this was Carl's Boston day, Prince was awarded the zinc derby. Carroll Curtis attended his first Boston reunion in years, his residence in Portland, Maine, for several years making necessary an introduction even to some of his old buddies. Most surprising and perhaps gratifying of all, however, was the return to grace of Sam Shapira, III. Sam had spent several years in Europe — but more of that later.

The inference in the notice of the meeting that there would be a reception to New York members prior to the dinner caused even Sid to arrive on time and the New Yorkers apparently to stay at home. After a very satisfying turkey dinner served by host Bridges, the Class in official session authorized the Secretary to make reservations for the 32d anniversary week-end reunion at Old Lyme next June, which action the Secretary had taken last June 6. Plans were briefly discussed and disposed of with the conclusion that the momentum of the good-fellowship of the last two get-togethers at this spot should automatically create an attendance of at least 50 in 1937. This, however, is sufficient notice until you get a more personal reminder that you plan to give your classmates the benefit of your good-fellowship at Old Lyme, Conn., on June 4, 5, and 6.

During the further round-table conversation, it was suggested that Shapira give a story of his European observations. Sam spent four years, 1928 to 1932, in Europe, principally in Russia. Returning in 1932, he has been since associated with the planning board of the city of Boston. His story of the "inside" in Russia, touching all phases — social, industrial, agricultural, and religious — was mighty interesting, especially the question-box period. As a matter of fact, the subject was so absorbing that a bowling date for 8:00 p.m. was nearly forgotten. Class adjourned with regrets to the alleys below, appeased somewhat by a promise of "continued in our next." The less said about the bowling the better. Glass

1905 Continued

arms and gutter balls appreciably lowered scores, the prizes for high going to Curtis, Buff, and Kenway, with scores of 166, 155, 150, respectively (number of strings not announced).

Side lights of the get-together: Shapira has a boy graduating from Boston Latin this year and matriculating at M.I.T. in September. Bob McLean announces, apparently with indignation and regret (respectively), that his company, the Carver Cotton Gin Company, makes neither a gin nor gin, but instead most every other instrument used in making cotton. Carl Graesser has stopped smoking — since last fall. His doctor said he must give up his pipe or his mountain climbing and he chose to say good-bye to his briar. Wesley Gilman announced that Luther Gilmore is now wintering at 221 North O Street, Lake Worth, Fla. Gilly had brought along a "get well" card, and under a message of encouragement, 21 members put their signatures with a hope to Lutie for his early return to health.

Bill Motter writes that he ran into L. H. Parker, I, in New York and persuaded him, almost at least, to attend our June reunion. Parker is chief of staff of the joint committee on internal revenue taxation and is one of the outstanding authorities on this subject. — Gene Kriegsman's (I) sister, Gretchen, informs us that Gene was transferred to Washington, D. C. (WPA), last August. Since then he has been in various sections of the country, principally in Florida. — A bulletin of the Massachusetts Department of Education announcing the program for 1936-1937 tells that Leonard W. Cronkhite, IV, is scheduled to talk on "The European Tumult" at the Gardner Auditorium, State House, Boston, on March 30. He is described as business executive and trustee, World Peace Foundation. Taking the cue from this, your Secretary has persuaded Cronkhite to talk informally on this subject at an '05 spring get-together sometime in April — notice of date later. — Bill Tufts, I, spurred on by an invitation to the February meeting, appeared at your Secretary's office early in February in the guise of a prospective purchaser of a pump. He didn't buy through disappointment because the Secretary, who hadn't seen him for 30 years, broke through his incog and called him "Bill of Candy Hill." Tufts is with the Associated Factory Mutual Fire Insurance Companies of Boston and his failure to make any of our reunions is due to his position's requiring much travel. Just the same, he admitted that if he planned four months ahead, he might persuade the boss to schedule him to southeastern Connecticut the first weekend in June.

Roland Bendann, with us for a while in Course V, is reported as at Hotel Belvedere, Baltimore, Md. Here's a chance for our Baltimore correspondent to get a life story. — George Jason, Jr., VI, gives a new address at Pond Street, Cohasset, Mass. Chance for correspondent Tower to get a write up. — Jim De Mallie, VI, has another business address, Care of Mallon

Oldsmobile Company, 497 Broad Street, Newark, N. J. Have we a contact man there who can locate when Uncle Sam's postman cannot? Can any class member tell us of the whereabouts of Isadore Niditch, V? His last address was 110 West 40th Street or 315 West 86th Street, New York City. Perhaps Hawkeyes Bell, Landers, Motter, or someone else, can supply the information which the M.I.T. Register Office wants. — FRED W. GOLDTHWAIT, *Secretary*, 175 High Street, Boston, Mass. SIDNEY T. STRICKLAND, *Assistant Secretary*, 209 Washington Street, Boston, Mass.

1906

Henry Ginsburg called at the office early in February and advised that he and Mrs. Ginsburg were starting, February 17, on a Pacific cruise, including Hawaii, Samoa, Australia, and New Zealand. In connection with his visit to Honolulu he had written to Carr and Furer, arranging to meet them there on his outward bound stop on March 4. The Secretary was privileged to read the letters of the two Hawaiians and on the strength of this reading hereby reports them in normal health and apparently pursuing their usual activities. Their letters seemed to be devoted largely to the shipping strike which was in progress at the time of writing. The complete tie-up of the American ships resulted in delays in freight and mail shipments which would have been very serious had it not been for the ships of other nations. Furer's letter was sent via the *China Clipper* on that account. Henry and Mrs. Ginsburg expect also to call at Hawaii on their return voyage and will be away from Boston for a period of about two months. Henry advised that he was taking his motion picture camera loaded with color films and he was admonished to get some interesting shots for the next reunion.

Classmates are probably wondering what became of "Thirty Years After." To date, about 70 replies have been received and, as noted in the February Review, some use should be made of the information although the original plans will have to be modified somewhat.

The Secretary regrets to report the death of another classmate, Herbert S. Whiting, who died, Tuesday, February 16. Herbert had suffered a shock in November, from which he never recovered. The following notice of his death appeared in the New York *Sun* of February 17: "Herbert S. Whiting, former Panama Canal engineer and president of the H. S. Whiting Company, manufacturers of electrical fixtures here, died yesterday at his home in Haworth, N. J., at the age of 51 years. He suffered a stroke after a prolonged illness. Born in Fitchburg, Mass., he was graduated in 1906 from the M.I.T. He worked as an engineer on the Panama Canal for two years, and about 20 years ago formed the H. S. Whiting Company. He was a member of the White Beeches Golf and Country Club in Haworth. Surviving are his wife, Mrs. Alma B. Whiting of Haworth; his mother, Mrs. Alice S. Whiting of Dumont, N. J.;

and a brother, Richard A. Whiting of Belmont, Mass. Funeral services will be held . . . at his home and burial will be in Gardner, Mass." Members of the Class who attended our 20th reunion at Old Lyme, Conn., will recollect how much Herbert and Mrs. Whiting enjoyed that occasion. The Secretary, in particular, recalls riding back to New York with the Coeys and Whiting and having luncheon at the White Beeches Golf Club. Herbert did not attend the 25th or 30th reunions. The sympathy of the Class is extended to Mrs. Whiting and the other members of Herbert's family. The Secretary acknowledges Charlie Wetterer's interest in advising of Herbert's death. — JAMES W. KIDDER, *Secretary*, Room 802, 50 Oliver Street, Boston, Mass. EDWARD B. ROWE, *Assistant Secretary*, 11 Cushing Road, Wellesley Hills, Mass.

1907

Through the thoughtfulness of Jim Barker of our Class, we have the following item from the New York *Times* of February 3, which indicates anew the position of influence and high standing achieved by Clarence Howe: "Ottawa, February 2. — United States aircraft manufacturers will benefit from the establishment of the trans-Canada air service for which an organization bill will be introduced in Parliament this week. C. D. Howe, minister of transport, who will have jurisdiction over the service, has stated that Canada must have airplanes which will compete with those operated by American air lines. Since Great Britain is preoccupied with the construction of military planes and has different flying problems, machines of the speed required must be obtained in the United States. The new corporation will be in the market almost immediately for 12 or 15 planes costing not less than \$60,000 each.

"The government measure is expected to create a corporation capitalized at \$5,000,000 in which the Canadian National and Canadian Pacific Railways will have a major interest, with minor holdings allotted to existing aviation companies. The Dominion government, however, proposes to exercise control in the interest of the public by reason of its \$8,000,000 investment in landing fields and other services. The government will defend its policy of giving the Canadian railroads a major share in the operation of the service on the ground that they have a large stake in the transportation business and have already suffered severely from motor-truck competition. The annual Canadian National Railway deficit as a burden on the public treasury is another consideration. Old-established airplane companies, however, will be permitted to buy stock in the new corporation and will be expected to continue to develop branch lines to the mining districts of Northern Canada, some of which depend entirely on air services. The trans-Canada system will be strictly limited to the main line between Montreal and Vancouver. It will be operated entirely by Canadian fliers."

1907 Continued

Charles Warren Nutter, II, whose address has been unknown for several years, is manufacturing reamers in a plant at Portsmouth. He is married and his address is R.F.D. Number 1, Box 77, Portsmouth, N. H. — The following fine letter from Lawrence C. Hampton, III, written on the letterhead of Union Oil Company of California at Los Angeles, was received by the Secretary late in January: "I have always been interested in 1907 class news and when my travels bring me home to where I receive my Review, I wonder why I don't write to you fellows more often. My work during the past 18 years has been most interesting to me, my family, and my friends. During this period I have been employed continuously by the Union Oil Company of California with headquarters at Los Angeles. My work has been so varied in this one company that I have worked at every phase of the petroleum industry in all parts of the world but Europe and the southern part of South America. During the past ten years, seven were spent in export sales and now the past three in domestic sales. In my present position I handle the distribution of petroleum products to our wholesale outlets in southern California and have standardized methods for distribution on the Pacific Coast. During the past year and a half, this has necessitated traveling between Los Angeles, San Francisco, Portland, and Seattle. In fact, at certain periods I commuted regularly between these points.

"In addition to distribution of petroleum stocks, I have under my supervision a small manufacturing plant where we compound and blend lubricating oils. We handle approximately 140 tons daily across our shipping platform. 'Distribution' means that we must order or manufacture the stocks we distribute and this calls for some good prognostication of what business is going to need three to six months in advance. Sometimes we are called upon to order Eastern lubricating oils 14 months in advance. On the Pacific Coast we do not work all the time. In the summer of 1935, we spent two weeks at Sequoia National Park. A few days after this splendid holiday we were sent to Portland, Ore., and our week-ends were spent on the Columbia River Highway and Mount Hood. Then we were sent to Seattle and our week-ends were spent in two trips to Mount Rainier, one to the Grand Coulee, one to Vancouver, B. C., and a delightful visit by water to Victoria, B. C. The summer of 1936 we spent our holidays at the world-famous Catalina Islands, Lake Arrowhead, and Yosemite Valley. During the past 40 years I have made many visits to these places, but they have such a fascination that it is always interesting to return.

"Six years ago — December 16, 1930 — I was married at Dubuque, Iowa, to Lucile P. Smith. As a bride she accompanied me to Nicaragua during the bandit days of Sandino. We had many exciting adventures. Later we made many trips to Panama and through Central America together by air and water. My wife was

a successful fashion artist, having been located in Atlanta, Ga., Little Rock, Ark., Los Angeles, Calif., and Sydney, Australia. On November 29, our son, Lawrence C. Hampton, 2d, was born. During the years since leaving the Institute, I have been in touch with Professor Charles E. Locke '96 about once a year. I am sending him a copy of this letter which will answer his good letter of recent date."

The Class Secretary is now most pleasantly associated with Frank J. Mooney in a substantial insurance and real estate business, with office at 694 Main Street, Waltham, Mass. The Waltham Travel Bureau, equipped to give complete service of information, securing tickets and reservations, by all bus lines, railroads, steamship lines, and air lines, is also a part of the organization. — Mrs. Dorothy Nichols Brown, oldest daughter of the Secretary, became the mother of a son on February 6. This is the second grandchild, as the oldest son, Bartlett Nichols, is the father of a daughter born on September 23, 1934.

Shortly June 4 will be here and with it our 30th reunion at Oyster Harbors Club, Osterville, Mass. It is time now for you to be making definite plans to attend. — BRYANT NICHOLS, *Secretary*, 126 Charles Street, Auburndale, Mass. HAROLD S. WILSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

1908

Paul Norton has been appointed to the faculty of Harvard University in the graduate school of design. — Edgar I. Williams is a member of the Allied Architects, who are now at work on plans for the administration building for the New York World's Fair for 1939. — We have just received word of the marriage of Bradford B. Holmes of New York to Dr. Katharine Fox Woodward, formerly of Worcester, Mass., and now of New York. Mr. Holmes is associated with the Pioneer Instrument Company in Brooklyn, N. Y.

It is with regret that we report the death on January 5 of our classmate, Tsok Kai Tse, in Shanghai, China, following an illness of seven weeks. At the time of his death, he was vice-president and general manager of the Western District Power Company. Following graduation from Technology, he returned to China and was appointed to the ministry of forests at Peiping. Later, he joined the engineering staff of the Kwangtung Electric Company at Canton, where he rose to the presidency. In 1928 he was appointed to organize the rolled tobacco administration of the ministry of finance, and soon afterward was responsible for the organization of the internal revenue administration, of which he was the director-general for six years. In 1934 he became a partner in the well-known firm of Swan, Culbertson and Fritz and continued his association with this firm until assuming the position he held at the time of his death. The Class extends its sympathy to Mrs. Tsok Kai Tse and the five sons and daughter, who survive.

Hardy Cross has been appointed professor of civil engineering at Yale University, as well as chairman of the department of civil engineering, the appointment to take effect next fall. Professor Cross has been professor of structural engineering at the University of Illinois for the past 15 years and is particularly known for his developments in rigid frame analysis. — We have recently heard that Maurice E. Denny of Dunbarton, Scotland, has been knighted, and is now Sir Maurice E. Denny, Bart. C.B.E. — We announce with regret the death of Eldridge I. Baker, which occurred on September 20.

We have the following changes of address to report: Benjamin H. Arnold, 2012 West Jackson Boulevard, Chicago, Ill.; Ygnacio S. Bonillas, Apartment 2332, Mexico D. F., Mexico; Rae W. Davis, 1529 South 76th Street, West Allis, Wis.; Captain Waldo P. Druley, Hotel Casa Loma, San Diego, Calif.; Oliver S. Jennings, 7125 Thomas Boulevard, Pittsburgh, Pa.; John E. Johnson, United States Department of Agriculture, 902 Grand Avenue Temple, Kansas City, Mo.; Clifford H. Preston, 120 East 19th Street, New York, N. Y.; Robert B. Todd, 6505 Second Avenue, North, St. Petersburg, Fla.; William H. Toppan, 18 East High Street, Newburyport, Mass.; Joseph B. Sando, 936 Marion Avenue, Cincinnati, Ohio. — H. LESTON CARTER, *Secretary*, 185 Franklin Street, Boston, Mass.

1909

Thanks to Dennie '11, who sent me post cards to Danville, Va., we have the following news: John Willard of the Hopf, Kent, Willard and Company, management engineers and accountants, spoke last January before the Worcester chapter of the National Association of Cost Accountants on the "Relation of Standard Costs to Budgets." — Felix A. Burton was elected treasurer of the Boston Association of Bowdoin Alumni at the annual dinner held recently at the University Club. — CHARLES R. MAIN, *Secretary*, 201 Devonshire Street, Boston, Mass. *Assistant Secretaries*: PAUL M. WISWALL, MAURICE R. SCHARFF, New York; GEORGE E. WALLIS, Chicago.

1910

The following announcement appeared in the Boston Herald of February 23: "Mr. and Mrs. Abbott Allen of Jackson Road, West Medford, announce the engagement of their daughter, Miss Elinor Foster Allen, to Mr. Douglas Percy Brayton, son of Mr. and Mrs. Percy Brayton of Allston Street, West Medford. Miss Allen attended the Framingham State Teachers College and Mr. Brayton is a student at the Theological School of Tufts College."

The following letter was received from Don Williamson: "It was a pleasure to hear from you, and I am very sorry that I have but little news of 1910 men in this vicinity to give you. Occasionally I see Harold Lockett, who is with H. H. Robertson Company, which firm manufactures particularly, I believe, asbestos

1910 Continued

metal-covered roofing material. Harold is the same genial fellow, and I always enjoy it when I run into him.

"As for myself, there is little new to say. This is the 12th year I have been conducting this business — manufacturing cold, odorless adhesives for the packaging industry. I find the work interesting and varied. For two years now I have served as president of the Adhesives Manufacturers Association of America. Ever since coming to Chicago I have been a member of, and active in, the Rotary Club of Chicago. There are three or four Tech men in that club, but I am the only one from 1910. I am planning to take my wife to the Rotary International Convention at Nice, France, this summer. My oldest daughter was graduated from Chicago University last year and is now married. My second daughter is a sophomore at Northwestern University. My son is a junior in high school. My telephone number is Canal 4201, and I certainly would appreciate receiving calls from any of our fellows who come to Chicago."

Frank Bell, our President, sent in the following: "There are not many 1910 men in this section. V. Z. Beall of Fort Worth, Texas, when I heard of him last, was in Edinburg in the Rio Grande Valley in charge of some PWA work. — We had a gathering of our local alumni association in honor of Dean Lobdell '17. There were only three or four old men at the gathering, among whom were Ballard Burgher '09 and R. F. Munoz '09. The rest of those present were mere infants, like the Dean. By the way, I had a letter from Lob inviting me to attend the 1917 class reunion this June. In replying, I stated that I fully realize that the Class of 1917 needs a little young blood to pep it up but that I was afraid I would not be able to get up there. However, I feel sure that the Dean can call on other 1910 men to add youth and beauty to his Class as needed."

"In reference to myself, I am still in the contracting business, same company, same associates, and so on. We have been fairly busy this last year, having built four or five grade-separation structures, paving and grading and sidewalk work for the Centennial, and some city paving and highway jobs, a disposal plant, and a water system. At the present time we have five pieces of work going on — one in Arkansas and four in Texas. We hope that contractors will not be so hungry as to take work too cheap in the future, which seems to have been the tendency in the past four or five years. — A local man called my house one evening and stated that he had just come in from California by plane with Hal Manson and wife, but, on account of bad weather, they had shunted off at Fort Worth direct to Boston, instead of coming by Dallas as they had intended, and asked him to call me for them."

The following excerpt from the Dallas (Texas) *Daily Times Herald* of January 17 was sent in: "F. F. Bell has held the squash championship of the club for several years, and they are still trying to

find somebody who can beat him. He went through the last season undefeated and has high hopes of repeating the performance in this year's tourney. — Since Frank holds the championship for squash, it might be well to arrange a meet between Frank and Jack Babcock at our next reunion!

Your Secretary received a letter from Gordon Hawes who is now located at 2361 Bryant Street, Palo Alto, Calif. Gordon left the Vacuum Oil Company of New York as lubricating engineer in 1925, due to his health. He was advised to go to California to recuperate. He has had a rather varied career since this time but seems to be the same old Gordon. He wishes to be remembered to all classmates. — HERBERT S. CLEVERDON, Secretary, 46 Cornhill, Boston, Mass.

1911

Profound sadness is indeed invoked by the word recently received from the Alumni Office that our loyal friend and classmate, Kanezo Goto, II, retired rear admiral in the Imperial Japanese Navy, died February 6. No details are available, as these notes are being written on Washington's Birthday. Our last word from Goto was just prior to our 25-year reunion a year ago, when, accompanying regrets at his inability to attend, he told of his work since retiring from the navy some years ago. In addition to acting in an advisory capacity to the Ryobi Denki Shokai, sole agents for Westinghouse in Japan, he was president of Nihon Dempa Company, Ltd. (Japan Electric Wave Company), manufacturer of wireless equipment. At the reunion we were all interested in a set of photographs of himself, his family, and his work, which he sent to Don Stevens just before the reunion. He was a life member of the Alumni Association and was present at our ten-year reunion at the Mayflower Inn, Manomet, in June, 1921. To his family go our sincere sympathy and regret at his passing.

Two visits to Worcester by classmates livened up February in great shape. My wife and I were delighted on February 4 to have Charlie Barker, VI, best man at our wedding 21 years ago, appear. Much reminiscing was enjoyed by all. Charlie is now president of the California B. F. Sturtevant Company, with offices in the Monadnock Building, San Francisco. He and Mary and their two sons, 11 and eight years, reside across the bay at 3139 Eton Avenue, Berkeley. Although the climate doesn't for a moment compare with Los Angeles, whence they came north in California about a year ago, they are becoming accustomed to the Golden Gate conditions and enjoying things. Charlie came East for a conference at the home office in Readville, Mass., and while here made headquarters with his mother in Dorchester. Good old Charlie!

In mid-February Harry Tisdale, V, came over from New York and spent two nights here at The Bancroft, making daily trips to Clinton for one of his clients who needed advice on dyeing problems. Harry is now sales manager of American

Dyewood Company, with which concern he has been connected for many years, making headquarters at 100 East 42d Street, New York City. He and Grace live in Scarsdale, right next door to Joe and Rose Harrington — all four of whom were at our Silver Reunion last June.

In the December issue of the *Marsman Magazine*, published by Marsman and Company, Inc., Manila, Philippine Islands, appears a tribute to Jim Greenan, III, entitled "Let's Get Acquainted." Greenan was graduated from Boston University in 1908 and then spent three years with us, getting his S.B. in mining in 1911. A native of Taunton, Mass., he left New England soon after graduation and for four years worked in various mines and mills in Colorado, Nevada, and California, being successively mucker, miner, timberman, millman, assayer, refinery helper, surveyor, and prospector. He had his first executive position in 1917, when he became general superintendent for the Olympic Mines Company in Nevada. At the outbreak of the War, barred from an officers' training camp by a minor disability, Greenan enlisted as a private in the 27th Engineers and went overseas. He rose from the ranks to an officer's commission, and at the close of hostilities was one of a group of officers appointed to examine and report on damages to the iron mines of Eastern France.

In 1919 Greenan returned to mining in Nevada and from there branched out into California, with occasional trips to Mexico or Alaska to do examination work. Finally, in 1930, he went to the Philippines to become general superintendent of the Benguet Consolidated Mining Company. Under his guidance several new ore bodies were found at Benguet and the plant there was enlarged from 300 to 500 tons a day, flotation testing was started, and operating costs were considerably reduced during his regime. He resigned there in 1933 to affiliate with the Marsman and Company and aid in formation of a mine consultation department. During the past few years he has developed two new mills for the company and a year ago visited the United States on vacation, subsequently returning and being now in charge of new business for the Marsman interests. He is married and has three children: Maeve, 12; James, 10; and Owen, seven years of age.

With his usual complete compliance with any request of mine, O. W. Stewart, I, thus summarizes a recent business trip: "The Ohio River flood of 1937 involved many of the manufacturing plants of the Associated Factory Mutuals, with which, through our inspection department, I am connected. Although our policies do not cover direct loss from flood waters, the condition of flood may set up unusual fire hazards not only for the plants directly involved but plants above the flood levels in communities where public utilities are affected. Public and private water supplies for fire protection may be impaired, electric power likewise; heating plants shut down, with consequent danger of freezing to sprinkler systems and domestic piping. Through timely action by ex-

perienced fire protection engineers much of the hazard can be reduced and efficient salvaging planned. For this purpose the inspection department stationed about 20 of our engineers at various cities along the Ohio. In order better to supervise this work directly in the two most important centers involved — Cincinnati and Louisville — I left Boston on January 25 in company with the editor of our monthly publication, returning to Boston on February 7. We arrived while the water was still close to crest heights at Cincinnati and similarly a few days later at Louisville. We had an opportunity to gain firsthand knowledge of flood hazards necessary to draw conclusions and lessons for the future. Incidentally, the March, 1937, issue of the *Factory Mutual Record* features the story and lessons of this flood as it affected manufacturing properties.

"The Factory Mutual Companies escaped with relatively small loss from the flood effects, due partly to splendid coöperation between our plants and our engineers, partly to the exceptionally mild winter weather, and partly to good fortune. We were involved only slightly at the fringe of that large fire in Cincinnati due to the burning of floating gasoline.

"Although the personal suffering in the flood centers was great and the property loss in homes, mercantile establishments, and manufacturing plants large, there was a cheerfulness . . . that was remarkable. To the casual visitor, the effects of the flood will scarcely be apparent in a few months. Meanwhile it is to be hoped that various protective measures planned to prevent recurrence can take tangible shape. Sometime I hope I can relate to you a few of the many interesting personal experiences."

Thank you, O. W., and you certainly will have an excellent opportunity to relate some of your personal experiences at the ladies' night which we are planning this spring at a date and place in Boston or Cambridge to be announced early in April. Undoubtedly other classmates have been in the flood areas but just haven't felt the "Write to Dennie" urge. Get it!

In describing the work of Helen Stansbury, petite director of the women's traffic division of United Air Lines, the *Boston Globe* recently referred to the fact that "the Boston office has a pioneer woman, too, in Miss Iris Beals, assistant to New England Traffic Manager Emmons J. Whitcomb at 18 Providence Street." Whit was here in Worcester recently on a short business trip and he said, despite the February airplane accidents in the West, business was fairly brisk here in New England for the offseason.

A few address changes from the Alumni Office: Eldred E. Besse, II, has moved from Lowell, Mass., to 30 North Street, Fairhaven, Mass.; Ethan A. Collier, I, from Roseburg, Ore., to 3330 Knott Street, Portland, Ore.; Captain (formerly Commander) Ralph T. Hanson, XIII-A, from Bremerton, Wash., to Apartment 706, The Royal York, Pittsburgh, Pa.; Hall Sargent, II, from Lemoyne, Pa., to

224 South Front Street, Wormleysburg, Pa. So end the notes for your Easter delectation. May spring prompt you to "Write to Dennie" right soon. — ORVILLE B. DENISON, *Secretary*, Hotel Bancroft, Worcester, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

1912

It is indeed a pleasure to announce the marriage on February 27 of Miss Sarah Porter Hunsaker, daughter of Jerome C. Hunsaker, XIII, to David Swope, son of Gerard Swope '95.

With deepest regret we announce the death of R. Bermudez, III. Bermudez made his home at San Pedro Sula, Honduras. — Word has just reached us of the death of Lew W. Beason, VI, Ogden, Utah, after a prolonged illness from heart disease. Beason had been connected with the Utah State Road Commission for 15 years. Besides his widow, he is survived by a son, Lew R. Beason, and a daughter, Annabeth Beason. — Vernon G. Sloan, I, passed away at his home in East Arlington, Mass., on December 27 from bronchial pneumonia. Sloan had for some years been head of the Slonite Welding Company, specializing in difficult welding problems. — Alfred N. Smith, I, passed away on November 18, but unfortunately no further details are at hand.

All signs point to a large turnout for the 25th reunion, which will be held at Cambridge, June 6, 7, and 8. Complete details will be mailed to all members of the Class, and the committee hopes that you will be able to attend the complete program. It was felt that by holding expenses to a minimum, a large attendance could be secured, and, in the last analysis, the success of any reunion depends on the number of those in attendance. We are looking to set a record in Technology history.

The Class was not without its representatives at the gala New York alumni banquet at the Waldorf-Astoria on February 24. Present were Kebbon, Dasso, C. B. Vaughan, Page Golsan, E. M. Mason with Mrs. Mason, and W. A. Rhodes with Mrs. Rhodes. — FREDERICK J. SHEPARD, JR., *Secretary*, 125 Walnut Street, Watertown, Mass. DAVID J. McGRATH, *Assistant Secretary*, McGraw-Hill Publishing Company, Inc., 330 West 42d Street, New York, N. Y.

1913

Bless you, Earle Caldwell, for a nice letter, the first unsolicited one which it has been my pleasure to receive during my short time back on the job. Earle's letter shows a very happy frame of mind and a nice family condition. He writes, on the letterhead of Florence (Mass.) Casket Company: "Greetings and welcome back to New England. I was on the point of dropping my subscription to The Review when I got the good news that you were back on the job and I thought, well, now we will learn a little about our old classmates. For the first time in my life I am going to practice what I preach and here goes.

"My first thought, Fred, is when I last saw you, at the 10th reunion in 1923. Norm Clark and I met you at Springfield and we drove down to Wellfleet. You had just been chewed up by one of your police dogs. Is that right? The only other memory is Giant Mahoney climbing up the side of the hotel and pushing out a couple of windows on the way up. There is really nothing new to write about myself. Still on the same job and keeping a jump ahead of the sheriff. Yet life has been very good to me, and things go happily along. My oldest daughter is a sophomore at Middlebury College and my youngest daughter graduates from high school this June.

"My chief interest at present is the Northampton Rotary Club. If you or anyone else happens to be in Northampton on a Monday evening, meet me in the Old Tavern at the Hotel Northampton at 5:30 and I will show them around. I am always there with a gang and the latch-key will be out. Sorry, Fred, I do not have more news but this will help a little bit; more power to you."

From the Alumni Office I have some address changes: Charles W. Brown, XIV, from Norwich, Conn., to Box 442, Middleboro, Mass.; Evan B. Cotton, II, from Boston to Damariscotta, Maine; John B. Farwell, II, from Brooklyn to 108 East 38th Street, New York City; Malcolm Lewis, VII, from Raleigh, N. C., to 401 West 10th Street, Wilmington, Del.; Ross D. Sampson, III, to 733 Hinman Avenue, Evanston, Ill.; Samuel W. Selfridge, II, from Los Angeles, Calif., to 225 Bush Street, c/o Standard Oil Company of California, San Francisco, Calif.

I had hoped that we could have a get-together evening during the winter for 13 men in the vicinity of Boston, but the flu kept me off my feet for over three weeks. However, I hope a meeting will still be arranged. — FREDERICK D. MURDOCK, *Secretary*, Murdock Webbing Company, Box 784, Pawtucket, R. I.

1914

Art Peaslee of Hartford dropped in to see your Secretary one day recently with an excellent suggestion: It is that when any classmate is planning to take a trip, going at all far afield, he let your Secretary know about it as far in advance as possible. The reason for the suggestion? Art left New York on October 10 for a trip through the Panama Canal, up the Pacific Coast, back East via the Grand Canyon and New Orleans. Art went alone. It was not until he returned that he read in The Review that just one week later your Secretary took almost the identical trip, also alone. A close check-up showed that, at nearly every city visited, this difference of exactly one week was adhered to, and at Los Angeles Art was checking out at almost the moment your Secretary was registering. As Art's trip was largely for pleasure, he had time to run up to Seattle and also to include Yosemite Park.

Through the courtesy of Buck Dorrance it is learned that Nemo Newlin has been elected a vice-president of H. M. Bylesby

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and Company. It is understood that Nemo has for some time been in charge of their Philadelphia office. Nemo was asked to comment on his promotion, and this is what he wrote: "I understand I am now eligible for untold lawsuits."—In recognition of his increasing field of activity, particularly in regard to processing-tax work in Washington, Phil Morrill, chief engineer of Bemis Bro. Bag Company at St. Louis, has been elected a director of that company.

Ralph Salisbury has for the past five years been with the lock and dam construction division of the Engineer Corps, War Department, and his present station is in Cincinnati, Ohio. Believing that such a position would have placed him in the center of the recent flood, your Secretary asked Ralph to write regarding his experiences. His prompt reply was so interesting that much of it is being quoted in full. Ralph wrote: "You picked on the world's champion flood dodger when you asked me for dope on the last and worst outburst of the Ohio and its tributaries. In five years unusual high water has occurred three times. The first was on the upper Mississippi (while I was in Chicago on leave). The second was the record flood at Pittsburgh last March, shortly after I had been transferred to the Ohio River division office here in Cincinnati. I had orders to inspect the dams being built up river, but delayed the trip on the theory that predicted rains would stop construction work. They not only did that but made a record. And I didn't see the excitement! Then last month I was driving around in the Muskingum Valley where the Corps of Engineers is supervising the building of 14 dams designed to hold flood waters in the tributaries and protect Zanesville, Ohio, from a recurrence of the 1913 disaster. The steady rains began to back the creeks up over the highways, so I headed back to Cincinnati, told them work in the field was rained out, asked for leave, and headed for Chicago. 'After me, the deluge.' If Noah had only had me with him, he could have saved all that trouble with the Ark.

"I succeeded in getting back to Cincinnati, January 26, the day the Ohio rose to its new record height of 80 feet. The office was on a 24-hour bedlam — cots in the offices and halls, with sleep if you got a chance. From our 14th floor we could see the muddy Ohio wallowing through the towns on the lower Kentucky shore, and at my home in East Walnut Hills we had only one electric light and no running water for 11 days. But that is all I saw of the flood. Army engineer officers and civilian engineers from all six of our district offices were down along the swollen river, organizing and operating rescue, evacuation, and supply services; using all the lock and dam crews, government floating plant, and whatever civilian help and equipment they could scrape together; cooperating with the Red Cross and local authorities. We of the division staff stayed in our cubicles, ears glued to short-wave sets or whatever information source we were

working with, but always getting our excitement vicariously and our information secondhand. . . .

"Like 'Death and General Putnam' these people along the lowlands fringing the river have faced floods before, and beaten them. They had the marks of the 1884 flood chipped on the faces of their houses as reminders of what the Ohio had once done. And this started as just another flood. As the waters rose, these people did just what they had done numerous springs before: moved their belongings to higher ground, or second floors, or attics, and waited, as the water surrounded them, for it to reach its crest and recede slowly. But the rain continued to pour down all over the valley; day by day the weather man raised his prediction a foot or so; the old record was passed; the river kept on rising; and still no end could be seen — which accounts for a large part of the losses, both of life and property. During one night the water rose three or four feet at Louisville so that some who could have waded to safety the night before were trapped and had to have boats if they were to be saved. The same thing held true along the reaches of the river and the backwaters of the creeks, only with less chance that some boat would come along to take them off. . . . Losses of buildings could not be avoided. Where towns were completely inundated, as at New Richmond — 30 miles up river — Aurora, Lawrenceburg, and smaller hamlets along the Indiana and Kentucky shores, Jeffersonville and New Albany, Golconda and Shawneetown, Ill., Paducah, and much of Louisville, frame buildings floated off their foundations to lodge against trees or structures or be swept to destruction by the current. But there was time to carry belongings, live stock, and people to ground above the high-water line if there had been any general belief that such a rise was likely or even possible.

"To me there were three outstanding developments in the catastrophe: One was the skill, sense, and efficiency with which City Manager Dykstra handled the emergency in this city. There was no delay, indecision, or oversight in tackling the situation and its possibilities. As a result there was no panic or other development which could lead to tragedy. Second, the use of police from the East and Middle West gave the towns down river trained aides. . . . And the third item was the swift delivery by other cities of boats and rescue apparatus and supplies. When we went to the Norwood waterworks to haul our supply, there stood huge tank trucks of the city of Cleveland, loading up to drive to delivery points throughout Cincinnati." — H. B. RICHMOND, *Secretary*, 30 State Street, Cambridge, Mass. CHARLES P. FISKE, *Assistant Secretary*, 1775 Broadway, New York, N. Y.

1915

As good engineers we should build our foundations early and securely so that our superstructures will be assured success. So, now in 1937, we are planning for our

coming 25th reunion in 1940. At a meeting of the general reunion committee at Walker Memorial, M.I.T., February 6, the following men agreed to serve: Frank Scully, chairman, Frank Foster, Newell Foster, Abe Hamburg, Wear Howlett, Azel Mack, Archie Morrison, George Rooney, Chet Runels, Henry Sheils, Jac Sindler, Herb Swift, Easty Weaver, Max Woythaler, Louie Young. Our general plan is to appoint regional men whom I shall list later; then to send out a general letter for class dues and donations, in which mailing will be included a special letter to our classmates in foreign countries. There will be also a request for suggestions for our reunion, particularly how we can best be sure that everyone will attend. Our plan calls for raising a substantial sum by voluntary donations spread over the next three years, which should entail no financial hardship for anyone. It is our hope that you will give generously, so that we shall make this a self-paying reunion with a successful and distinctive party.

The general committee is very enthusiastic over the possibilities of this plan, and I, personally, am tremendously pleased with the spirit everyone is showing. I hope the same feeling will spread to you all, so that you will help us make this a splendid party. The following men have been asked to serve as regional committees to solicit and contact our classmates in their respective territories: Metropolitan New York, Jim Tobey, St. Elmo Piza, San Willis; Philadelphia, Herb Anderson; Baltimore, Bill Spencer; Southeast, Laury Geer; Southwest, Guernsey Palmer; Pacific Coast, Dave Hughes; Central West, Allen Abrams; Chicago, Carl T. Dunn; Michigan, Loring Hall; Ohio and Kentucky, Herman Morse; Pennsylvania, Fred Vogel; New York State, Gabe Hilton and Ben Neal. I haven't heard from all these men, but I feel that I can count on their help and cooperation and, with this representative line-up, we should be able to get some good action. You will shortly receive your first letter and I shall be extremely interested and anxious to have your answers. Incidentally, we hope to have a regional meeting in New York this spring with all our gang around there and show them Speed Swift's entrancing and appealing movies.

Poor Herb has had to go South to recover completely from his recent appendectomy and, just before leaving, divested himself of this funny line: "Were you a party to my being elected a candidate for representative-at-large on the Alumni Council for the two-year period beginning July 1? In any event I have accepted the nomination and, being a Republican, await the election results in fear and trembling. Perhaps I had better get out a new movie title, 'Help Speed Wind.'" Those of you who recall Herb's "Help Azel" movies will no doubt get a laugh out of his ambitions for himself.

In the New York *Times* of January 12 we read: "Dr. James A. Tobey of Rye, N. Y., was re-elected president of the Westchester Tuberculosis and Public

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Health Association at the annual meeting of the directors yesterday in the Town Hall Club." Our admiration to Jim for the time and interest he gives to public and civic activities!—Never mind the gold standard, build up 1915 capital and reserves for a silver (anniversary) boom in 1940. Yours for it!—AZEL W. MACK, Secretary, 40 St. Paul Street, Brookline, Mass.

1916

Warren A. Strangman, II, writes as follows about his work: "Except for service during the World War, first in the Army and then in the Navy, I have been employed in the fire insurance inspecting business for the past 17 years; in fact, with the above concern (Eastern Underwriters Inspection Bureau, New England Division, 40 Broad Street, Boston, Mass.). The work is very interesting, taking me, as it does, into all kinds of properties. I have been kept continuously very busy making periodical reports on such properties as Harvard College (100 buildings), and similar institutions, hospitals, oil plants, and oil refineries, in addition to routine work on sprinklered risks. One very interesting assignment was the Boston Water Front and Oil Terminal Survey in 1934, made jointly by my bureau, the Boston Board of Fire Underwriters, and the New England Insurance Exchange. I have been very busy in the last year or so helping to train five new men for our New England and New York divisions. I wish I could give you some 'interesting high lights,' but it happens that practically all of my life since graduation has been one of inspecting and report writing, rather prosaic activities for those to hear about who are not actually in the business. To me, of course, it is all intensely interesting. The sights that I have seen, the processes I have studied at close range, and the people I have met, make a background that 100 years of college could not equal."

Your Secretary just received a note from Steve Brophy which includes the following sentence: "I am sure every member of the Class who gets The Review gives you a vote of thanks when the book is opened and he finds 1916 represented in 'News of the Classes.'" Your Secretaries are not looking for bouquets, and a "vote of thanks" which you classmates can give which will be most appreciated is to write your Secretary once in a while telling him what you are doing and reporting on classmates whom you have seen recently. After all, this is your news and I am merely doing the clerical job of putting it together for The Review.

Joe Barker comes to my aid with the following: "I have had your letter of January 26 on my desk hoping to be able to find the time to ring up some of the 1916 men, but as usual the time has slipped by without my being able to do so. I was in Boston last week and saw Paul Hatch for a short visit. Paul is still with the New Hampshire Power Company, managing a property for them in New Hampshire and commuting back and forth from his home in Wellesley

Hills. As you know, I am still at Columbia in the Engineering School, attempting to bring along a few competent young men to take our places in the engineering profession. Yesterday one of my students brought me greetings from H. F. Dodge of our Class, who is with the Bell Laboratories in New York, where he is making real contributions to the development of our telephone service. These are the only classmates from whom I have had news since the grand reunion last June. Of course you know that Bailey Townshend is with the Johns-Manville Corporation as director of research, but unfortunately I have not had a chance to see him."

Horace L. Bickford, who was not in a position to attend our reunion last June, gives us the following very interesting story of his activities: "It was just by chance that I read your letter, because it was mailed in one of your company's envelopes and I thought it was just another of those 'damn insurance guys' trying to sell me some more insurance. So, if you do not receive replies from some of your other letters, this may be one of the reasons. It was certainly good to hear from you, although you didn't say much about yourself but asked me to write a few lines regarding myself. Well here goes; it may sound something like an application for a job, but it isn't. For the last three-and-a-half years I have been employed as an engineer in the machinery scientific division of Gibbs and Cox, Inc., who are engaged in naval architecture and marine engineering. We are doing the engineering and designing of the new destroyers for the United States Navy.

"The DD 364 to 369 class which are 1,500 tons displacement have just been completed and delivered; two were made at United Shipyards on Staten Island; two at Bath, Maine; and two at Federal Shipbuilding, Kearny, N. J. These six destroyers have made a very good name for themselves. DD 381 and 383 are of the 1,850-ton class and are being built at Federal. Then there are the DD 394 to 396 and DD 397 to 399, three of each of the 1,500- and 1,850-ton classes, which are being built at Federal and Bath. We have just commenced to work on the DD 409 to 414 which will be a much heavier destroyer and they will be fabricated at Bath, Federal, and Newport News. The destroyers numbered between those given above are being built at the several government yards on both the East and West Coasts and quite a few of them according to our plans.

"What do I do? Well, I am one of the 'brain trusters' and calculate the stresses and strains to be expected, and so on. For example, the determining of the proper size of shafting, the stresses in the main steam piping when carrying 600 pounds per square inch at 700 degrees F. steam, also the figuring of the complete heat balance of the vessel for the various contract speeds, witnessing tests at vendors' plants, going on the builders' sea trials of the vessels themselves, and so on. The reason that I was unable to be at the reunion this summer and say 'hello' to everybody was that I was on builders'

trial of one of the destroyers. No, I wasn't seasick, and if any of you want a thrill, it is to be aboard one of these destroyers dashing madly through the water at an excessive rate of speed.

"Aside from shop talk, as you all know, I am married and have one boy, Horace L., Jr., who will be graduated from the Hawthorne High School this next June and wants to become an engineer. This last January I was guest speaker at the Union County Chapter of Professional Engineers at Elizabeth and gave a talk on 'What Penalties Bunker 'C,' or Costly, Low-priced Oil vs. Cheaper, High-priced Oil.' I have a license to practice professional engineering in both the states of New York and New Jersey, and am secretary of the Passaic County chapter of the New Jersey Association of Professional Engineers and Land Surveyors. In the past, I have revamped a brake-lining factory, worked on the design of a copper refinery, designed and erected a plant for the manufacture of water-purification materials, operated a machine shop, been in the rubber business, and so on. I certainly hope that you can get some sort of a story out of this for the April issue of The Review. You may or may not know that it is extremely hard to write about oneself."

The Thursday, February 11, issue of the bulletin of The Merchants' Association of New York, carries the following interesting story about Tom Holden: "What is generally regarded as one of the most constructive contributions yet offered toward the solution of the nation's perplexing housing problem was made last week by The Merchants' Association when, under the title 'A Business View of the Housing Problem,' the Association published, in pamphlet form, a report outlining the policies which it believes should be followed by various legislative agencies. Copies of the pamphlet have been sent to all members of the Association. The conclusions were based on a study carried on for several months by the Association's special housing committee, consisting of Thomas S. Holden, chairman, W. Gibson Carey, Jr., Andrew J. Eken, John H. Finley, Robert L. Hoguet, Arthur C. Holden, F. R. Howe, deLancey Kountze, and Ralph W. Morrell. The report was approved by the Association's board of directors on January 27. Generally speaking, the report is an argument for the development of a plan which will bring about the solution of the housing problem by private enterprise on an economic basis, rather than through the wholesale entrance of the national, state, and local governments into the housing field." Tom, by the way, is also president of the Greater New York Building Congress.

We have already given sufficient publicity to the marriage of Ken Sully out in Los Angeles, but a recent letter from Ed Clarkson gives a little further information concerning this major event in 1916 class news of the year, and I quote in part from his letter referring to Ken Sully's marriage: "The wedding was followed by a reception at the home of the bride,

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at which a good time was enjoyed by all. The bride and groom departed in a pouring rain for parts unknown. It is rumored that they went to San Francisco, but being greeted by torrential downpour, finally returned to Los Angeles County, to bask in the eternal sunshine of this area. Due to the influx of Eastern visitors into the Hollywood area, the newlyweds are temporarily making their home at 654 South Detroit Street, Los Angeles, Calif. They expect to be permanently located somewhere in Hollywood in the near future, at which time I will be glad to forward you their address."

From a very imposing letterhead carrying the statement at the top: "Wm. W. Drummey, Superintendent, City of Boston, Department of School Buildings," I have the following communication to hand on: "Glad to have heard from you. This note paper tells a four-year story. I was in private practice in my own name at 80 Boylston Street, Boston, for the ten years before that (architect). Here I'm in charge of a \$74,000,000 plant, housing 140,000 kids in 312 permanent places, and some 50 temporary places; all executive functions of schools, except education. Built some \$3,000,000 in new buildings last year. Staff of 80 engineers, draftsmen, inspectors, clerks, and so on; 1,000-plus WPA workers. One M.I.T., Leo Hartnett '13. . . . Married; three sons, one died. Live, 87 Mount Vernon Street, West Roxbury. Gave six lectures in 1935 at M.I.T. and occasionally quack for State Department of Education. Sometimes write and mark exams for engineers (civil or structural) for State Civil Service. Belong to neighborhood club, City Club, Kiwanis, and so on. Am not old enough to play golf. Do a bit of shooting (guns, not crap), have a kids' boxing class of 100-pound gamecocks which tends to keep the lard to some extent from piling on my carcass. Indoor amusements: chess and poker, which of themselves constitute a postgraduate M.S. Seriously doing some work at Northeastern University here that may have a degree tied on it this June. We old birds 20-plus years out get a bit rusty. . . ." How about it, fellows? Do you find this sort of news interesting? If so, let your Secretary have the dope.

One of the most interesting letters I have received recently comes from Leonard Besly, XV, written on letterhead from the office of vice-president, Thomas A. Edison, Inc., West Orange, N. J. He writes as follows: "There's no news about me. I'm not married and can't announce any new arrivals or other items like that. I am leaving today for a vacation in Florida, which explains this scribble. Regards." Perhaps some of you fellows living in northern New Jersey or New York will contact Besly and find out what kind of a time he had in Florida and dig up some news for a future edition of the class notes. — JAMES A. BURBANK, *Secretary*, The Travelers Insurance Company, Hartford, Conn. STEVEN R. BERKE, *Associate Secretary*, Coleman Brothers Corporation, 245 State Street, Boston, Mass.

1917

Robert N. Gay reports that his fame as "Backlash Bob," charter member and president emeritus of the Gulf Coast Backlash Associates of Texas, is spreading throughout the English-speaking world. His fan mail is increasing rapidly, and it seems to follow curiously the travels and lines of communication of a certain peripatetic dean. Mighty are the tales that will be told at Marblehead.

Hamilton L. Wood, chairman of the committee in charge of the 20th reunion, is taking preliminary steps. He plans to have this reunion a model of its kind; a reunion not to impress the populace, not to establish records for attendance and noise, not to enrich the beverage distributor, but to send the participants back with a grand old satisfied feeling. Ham makes this appeal for aid: "In view of the fact that the 20th reunion of the Class is to be run for those attending rather than for the purpose of satisfying the whims of the committee, I would greatly appreciate it if you will incorporate a notice in the class notes in the next issue of *The Review* to the effect that suggestions are urgently requested by the committee. (These suggestions should be sent to H. L. Wood, 9th Floor, 40 Broad Street, Boston.) Cooperation of this sort on the part of the membership will greatly assist the committee in conducting a reunion which will be attractive to those attending. At a later date, information will be sent to all members of the Class giving the dope as to reservations, prices, and so on, at the Corinthian Yacht Club, Marblehead." — RAYMOND STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass.

1918

It was, to be sure, a somewhat ragged and public invitation issued to Kenneth Reid last January via these columns that he lay aside his editorial cares for a twinkling and honor us with a few fascinating paragraphs. Perhaps he never received the invitation; perhaps he got faint just thinking about it; perhaps he wondered what we would do if. Well, here's what: Fifteen years ago under date of May 18, 1921, Ken wrote us a letter from Post Box 428, Calcutta, India. Its publication isn't exactly dipping into new realms, but it is at least a letter from Ken and, failing to solicit a more timely communiqué, determined not to be baffled, and not wishing to be a ceaseless fussbudget striving to extract unwilling juice, we dig an honorable document from our dusty files. Let it be a lesson to the rest of you. Just what kind of lesson isn't quite clear, but let it be a lesson, anyhow. . . . You inquire about the dancing dervishes of India. Believe me, they do *not* compare favorably with the 'toddling' houris of Portsmouth, and many a time I wish that I could envelop one of the latter in my arms to the strains of 'La Vida' or 'My Baby's Arms.' However, those catch-as-catch-can days are over and I must content myself with the company of less alluring individuals.

"You likewise evince an interest in Hindu profanity, of which I *could* give you several exceedingly potent examples. But this letter may be subject to the board of censors and you will have to be contented with the more innocuous phrases such as *Kutch-Paroya-Nai*, which is the Hindu equivalent of 'I should worry,' or *Sala-Suorka-Bachha*, which means 'Thou art the son of a pig.' (The Hindus when they wish to be abusive take great delight in casting aspersions upon the ancestry of the abusee.) I suppose you might be interested in what I am doing out this way. Well, I'll tell you: I am working with the Angus Company, Ltd., which is closely connected with the Bemis Bro. Bag Company of Boston, of which you no doubt have heard. The Angus Company, last January, simultaneously acquired my services and the sole agency in India for The American Rolling Mill Company and the California Corrugated Culvert Company. Logically enough, upon my arrival here, they put me to work getting business for these two concerns and I have been traveling extensively about India, interviewing public works engineers and attempting to sell Armco iron and Cacro culverts. I have not yet obtained many orders but have had a great deal of pleasure from my travels. My last trip lasted six weeks and included Madras, Colombo, a motor tour of Ceylon, Rangoon, and Mandalay (that place of romantic interest which is entirely unwarranted by fact). I have written to several people a short description of such a trip and if you do not mind my copying the same guff again, I will continue with this travelogue. (Rather a neat idea to economize on paper this, isn't it?)

"We will begin by leaving Calcutta. You leave Calcutta at eight o'clock at night on the Madras Mail and arrive in Madras the second morning after at about nine; then probably stay over night at the hotel there to rest up before going on, for traveling on the Indian railways is rather an exhausting business. The trains are divided into compartments: first, second, intermediate, and third classes. The white 'sahibs' and occasionally some of the wealthier natives use first class, Eurasians and natives a little further down the social scale use second class, while the great majority of the natives travel third and are herded in, in a fearfully unsanitary jam like the passengers on the Boston subway cars. The compartment you find yourself in, extends right across the train and is about ten feet long with a small bath compartment connected at one end. There is no connecting door or passageway to the rest of the train so you have to stay put in your compartment while the train is moving. There is a third-class compartment specially for servants, near by, and your personal servant whom you take with you wherever you go sleeps there. He brings you your tea at stations and makes up your bed for the night. You have to carry your own roll of bedding, for that is the only way to insure cleanliness. The compartment is designed for

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four people — upper and lower on each side — but you usually have only one person in with you.

"Your meals on the way are obtained at station dining rooms and you eat while the train waits. It seems as though one is eating all the time in India. First in the day comes chota hazri, or little breakfast, at about seven. Then about 8:30 you have regular breakfast which carries you along until about 11, when you have morning tea. Tiffin or lunch comes at 1:30 and afternoon tea at about four. The day is completed by dinner at eight, for which meal you dress, except when traveling. When I am in Calcutta I have all these meals and teas, the tea being brought in to my desk by a khidmatgar or table servant. With all these meals it is difficult to keep from overeating; the food tastes so good with the oriental cooking. (But, oh how I would appreciate a good old piece of apple pie and a cup of real coffee at Thompson's!) But to return to the railways: The universal fuel is soft, very soft coal, and since on account of the heat the compartment windows are kept wide open, everything gets grimed with coal dust and you simply cannot keep clean. You look forward with pleasure to the end of the journey when you can go to the hotel, luxuriously bathe, and change into fresh clothes. Then you feel like a human being again.

"The hotel at Madras was quite a comfortable place and I enjoyed stopping there. At night you had to be careful in walking around the grounds on account of cobras; didn't see any, though. Madras is a widely spread out city. The population is about a half a million, but the city covers an area seemingly as great as that of New York. Some of the European residents have enough land around their bungalows (every house is known as a bungalow in India) to lay out a nine-hole golf course on it. And all the business section is scattered, with its buildings well set apart. I suppose this feature is to get plenty of air, but they certainly do carry it to extremes. The city is right on the ocean front, with a fine beach. Too bad you can't swim there for fear of sharks. I stayed there for about five days before shoving off for Colombo.

"Colombo is a matter of two nights traveling from Madras, with a little variation from train travel sandwiched in, in the form of a 25-mile ferry-steamer ride across Falk Straits. It was my good fortune to ride over in this ferry with M. Clemenceau, who has been touring around out this way. There were only three other white men besides his party and myself on board so I got a pretty good look at him. Didn't quite have nerve enough to speak to him, though. He is pretty well preserved for a man of 80 and still has lots of pep. Well, I finally reached Colombo and taxied to the hotel, and right there I decided that Colombo was the place for me if the company ever opens up an office there. The sky and ocean there are the bluest, the clouds the whitest, the long, sandy beach is the cleanest, the sea breezes sweeping in through the waving palms are the fresh-

est of any place I have been. And then when it gets too hot you can go up about 80 miles into the interior and reach an altitude of 7,000 feet at a place called Nuwara Eliya, where it is delightfully cool, sometimes even cold. The whole appearance of the town, and indeed of the island, was very attractive to me and I do not wonder at its being called the Pearl of the Orient. If it were not so awfully far from the United States of America, I wouldn't mind living there for a good many years. However, you can get nearly the same effect at Honolulu a lot nearer home. I am certainly glad to have visited there once anyway.

"I spent my time in Colombo at the Galle Face Hotel, which is, to my mind, the best hotel in the East. It has a wonderful location right on the ocean, looking toward the sunset sky and has a very famous group of coconut palms leaning out toward the water in front of it. At sunset you sit on the terrace looking out through these graceful palms silhouetted against the most gorgeously colored skies imaginable. You can dream yourself in fairyland with very little effort. After being in Colombo for about a week I went on a five-day motor tour of the island, stopping at Kandy, Trincomalee, Anhuradapura, Dambulla, and on the way back at Kandy again. It was really the most remarkable ride I ever took and I saw more strange and interesting sights than I could in a month anywhere else. The road from Colombo to Kandy was upgrade nearly all the way, for Kandy has an altitude of 1,600 feet and is only 73 miles away. For the latter half of the way, the road winds in and out as it climbs through the hills and you get glimpses of scenery strangely like the White Mountains. This is especially true as you go through the rubber country because the rubber leaves change color something as do our oak and maple leaves, only not quite so brilliantly. Along the roadway grow palms of all varieties: coconut, betel nut, palmyra, cabbage, and banana, intermingled with groves of bamboo, banyans, mangoes, and other tropical trees. Among them are to be seen the many native villages with their thatched roofs on bamboo-sided huts. In every available valley advantage is taken of the low, flat land to grow rice, as Ceylon does not produce anywhere near enough of this staple food for her own consumption and needs all she can grow.

"Once in a while we passed an elephant ambling along with a mahout on his back, or, rather, on his neck. They were the first elephants I had seen out this way. I took several pictures of them because they were new to me then, but I have seen so many since, in Burma as well as Ceylon, that they have grown commonplace. At a place near Kandy where the road is winding about in hairpin curves it passes right through a great rock jutting out of the hillside. In the old days, so the story goes, when Kandy was a flourishing city with its kings and splendiferous courts, a prophet arose in their midst — as prophets have a way of

doing — and told the world that when this particular rock was pierced, Kandy would fall. The Singhalese at the time were at war with the Kandians and somehow or other they managed to cut through the rock, whereupon the prophecy was fulfilled. Subsequent generations, I among them, have all passed through on their way to Kandy.

"Kandy itself is the capital of Ceylon and a very beautiful place. Its altitude causes it to be cool and at the season when I visited it a lightweight overcoat was a real necessity at night and in the early morning. The center of attraction is a pretty, artificial lake built by the old kings about 800 years ago. The hotel is right beside this lake and I had a room overlooking it. A little way along the shore is the 'Temple of the Tooth,' said to contain a tooth of Buddha and hence a very popular shrine for the religiously inclined. The tooth itself is kept carefully hidden and is never seen except by some of the high priests, but they carefully spread the story and emphasize its holiness. On the walls of the structure are painted somewhat crude, but undoubtedly convincing representations of the punishments to be inflicted in Jehannum for each sort of sin. If the people believe in this sort of thing they should be the most virtuous individuals on earth. It is interesting to note that one of the items for which perpetual fire is meted out is the sin of a woman who talks too much.

"Outside the temple is a pool, connected underground to the lake. In this pool thousands of turtles congregate to be fed by the priests as a daily ceremony. Some of them — the turtles, not the priests — are reputed to be as old as the lake. The botanical gardens I did not visit until my return trip, so I will wait for a while before describing them. They are said, very plausibly, to be the most beautiful in the world. And now I think I have caused enough wear and tear on the typewriter for this letter and have given you as much of my time as you deserve for the present. I shall hope to hear more from you anon, and remember that I will be just as much interested in what is going on back in Boston as you may be in what I am seeing out here."

John Clark and Tom Kelly have both been out our way. Tom has been having a little trouble with his stomach but flourishes mightily now on eggs and milk. John is at Cornell, where he has taught mathematics. Among other diverting tales he reports that Dick Wilkins still lives in Rome, N. Y.; is vice-president of the Revere Copper and Brass (yes, old Paul Revere's company, and its still doing well, thank you, despite the British, the Supreme Court, and way stations); and still has charge of development and research. Maybe you remember that, aided by a couple of husky fraternity brothers, Johnny copped the first *Technique* paddle as it came out of the little house.

The New York brethren dined again on February 10, this time at the Midston Club, 22 East 38th Street. These perform-

1918 Continued

ances are beginning to reek with all the earmarks of a growing habit. Pete Sanger is the boy to contact.

Ray Miller reports from the bewitching city of Salem (Mass.): "I saw John Kilduff this week. He looks well as ever; is the engineer for the Amesbury Metal Products Company, Inc., Amesbury, Mass. The plant occupied by his company was where some of the first automobile starters were made (for Gray and Davis, I believe). John will be interested in the 20th reunion. We both began to realize its nearness, as he has a lovely 14-year old daughter, Jean, about ready for Amesbury High School. (Your decrepit Secretary has three now in high school, one of whom goes to college this fall.) John sends his best wishes to all the gang, and will appreciate a line from any of them. — Tom Knowland was in Germany last year for a short visit."

We should be memorialized for not reporting last month an event which surely is crammed with possibilities. A psychoanalyst would say our failure was due to certain adolescent resistances to being rigorously scrubbed in the right places by a zealous mama. He would be wrong. We just wanted to be downright selfish and enjoy it all by ourselves for a while. You see, Earl Collins has moved from Little Neck, Long Island, to Great Neck, Long Island. Sort of a promotion, Earl? — F. ALEXANDER MAGOUN, *Secretary*, Room 4-136, M.I.T., Cambridge, Mass. GRETCHEN A. PALMER, *Assistant Secretary*, The Thomas School, The Wilson Road, Rowayton, Conn.

1919

By the time this literary masterpiece appears in print, the second annual get-together of those in the Class around Boston will be about to take place. Although no definite decision has been made, it looks as if this would occur on Friday night, April 9, at the University Club: dinner at 6:30 P.M., followed by bowling, downstairs. Liquid refreshment can also be procured by those interested.

We had a splendid turnout of 21 men at the December get-together at Walker Memorial, and at least another 10 stated that they were unable to attend on account of previous business engagements but could be counted on next time. Notices will be sent to all those in the vicinity of Boston; kindly let us know in advance if you are coming, since definite reservations and guarantees are required by the University Club.

We received two letters from graduates of Course VI now living in Spokane, Wash. Strangely enough there is a striking resemblance in their names. I am wondering if they know of each other's presence in that remote section of the country. One is Edward E. Scofield, who is manager of industrial sales of the Washington Water Power Company. Ed has two young ladies: Elizabeth, five years old, and Marion Ellis, one-and-a-half years old. The other letter is from Edward E. Saunders, who is assistant secretary of the Gladding, McBean and Company and manager of Spokane opera-

tions. Ted says that his company covers the Pacific Coast from Los Angeles to Seattle, manufacturing clay products. He has a son, Edward, 13 years old, and three daughters: Carol, aged 11; Gertrude, four; Eugenie, two. Not bad! Ted is upholding the prestige of the Class in other ways, being president of the Y.M.C.A., trustee of the chamber of commerce, and past president of the Rotary Club. It looks as though Ted would be a good one to show us the historic spots of the town whenever we are in the vicinity.

I have heard also from Karl F. Rodgers, II, who is now a member of the technical staff of the Bell Telephone Laboratories, Inc., New York City, working on the development and design of electrical condensers. Karl has a junior, nearly seven years old, and a daughter, Delorma, who is about seven months old. He sees three or four of the Class also at the Bell labs and says that Ralph Gilbert is quite a family man now and hasn't changed a bit except that he no longer blows his chewing gum into his bugle.

Also heard from was Henry E. Wilson, lieutenant commander in the United States Navy, whom I used to see quite often up to 1932 when I called at the Portsmouth Navy Yard in New Hampshire. Henry was in charge of the power plant and other mechanical engineering in connection with the operation of the yard and was always very cordial and cooperative in seeing to it that the Brown Instrument Company received their share of Uncle Sam's business. His recent letter, however, came from Pearl Harbor, Territory of Hawaii, so it looks as though I would not have the pleasure of calling on him for a while. He has three boys: Henry, 12 years; Robert, eight; Don, four.

Those of you who are around Boston, don't forget to save April 9, and send us word that you are coming. The rest of you who still have questionnaires, kindly send them in, as they are our principal source of news. I have additional blanks for any of you who have mislaid your first copies. — ARKLY S. RICHARDS, *Secretary*, 26 Parker Street, Newton Centre, Mass.

1920

The medal for class loyalty should go to Dusty Miller who took the time from a brief trip here from his home in Texas to come in and check up on the rumor that your Secretary was still alive. Dusty is head man for the Johns-Manville Corporation down there in the cow country, and apparently the life and climate agree with him, as he looks hardly a day older than he did at the Institute. He is also head of a young and growing family. In addition to the pleasant visit with Dusty, your Secretary has actually laid his eyes on four other classmates during the last few weeks, which is something of a record, as ordinarily they seem to avoid him pretty successfully. Not long ago Perk Bugbee and the writer had the pleasure of giving Jim Gibson and Buck Clark a few pointers on the ancient and honorable

game of poker. Believing, and rightly, that the Bugbee twins were no experts, these two boys inveigled them into a game at Gibson's house in Newton, Mass., expecting to get lunch money for the next few weeks, but they were sadly disillusioned. Buck has left Putnam and Company and is with another investment outfit in Hartford, Conn., the name of which has slipped my mind. I will be pleased to give him an advertisement in the next Review if he will give me the necessary information.

I ran into Bill Meissner on 42d Street in New York recently and learned that he was still doing business as an architect, with offices at 15 West 38th Street, New York City. Mouse has been doing some interesting work on modern housing and has made quite a name for himself in this connection. He told me he had seen Hank Caldwell, who is still with the Swenson Evaporator Company and is living in Greenwich, Conn. I also got a glimpse of Heinie Haskell recently and, what's more, got a very nice letter from him chiding me gently for lack of class notes recently on the theory that as an advertising man I should be able to improvise, even if I didn't get any facts to go on. Heinie is a worsted tycoon, running a large and successful mill in Moosup, Conn., which turns out high-grade men's wear worsteds. Incidentally, he runs the only complete vertical worsted mill in the state of Connecticut. In addition to running the mill and a sales company in New York City, he is a director of the Plainfield National Bank. Heinie reports that the twins are growing up fast, although they haven't yet reached the stage where he can put them to work in the mill. He says he has heard from Moose LeFevre '21, who is now in Chicago, and that Moose reports seeing Dode Spiehler, who is also in Chicago and is raising a family.

We learn that that old politician, Ken Akers, is still at it, having been recently elected president of the Bay State Club, an organization of Massachusetts insurance men. Ken is special agent for the National Fire Insurance Company. Another classmate who has been getting in the public eye of late is the Rev. Franklin H. Blackmer, who has just been elected president of the New Church Theological School in Cambridge. Blackmer has held pastorates in San Francisco, Calif., and in Brockton, Mass., and was also president of Urbana University, Urbana, Ohio. — Still another classmate who has distinguished himself is Alfred T. Glassett, Vice-president of the Building Contractors and Employers Association of New York City. Al is conducting studies in building construction estimating for Columbia University.

We have a bit of news from some of these far-off miners of Course III: A. A. Brown is back in Mexico after a brief visit in New England last summer, and his pal, Syner, also was up here in Taunton, Mass., for a vacation but is now back in Mexico. Neither Brown nor Syner can claim the honors as far as family goes, as each has a wife and three

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children. — Marcial E. Martinez is general manager of the large Pedro de Valdivia Nitrate Plant in Chile. . . .

Henry Erickson, who has been in the sales department of Allis-Chalmers Manufacturing Company for a number of years, resigned recently and is now associated as vice-president and chief engineer with the Separations Engineering Corporation, 110 East 42d Street, New York. Bunk Talcott has left Chicago and is now in Torrington, Conn. Donald Ferris has left Tarrytown, N. Y., and may be reached at 700 Seward Avenue, Detroit, Mich. Bill Welch has been located at 127 Delaware Avenue, Tonawanda, N. Y. We would like to hear from you, Bill.

Phil Byrne is with the Standard Oil Development Company, Elizabeth, N. J. Fritz Boley is now at 7244 South Coles Avenue, Chicago, Ill. Erwin Harsch is with the TVA at Chattanooga, Tenn. Rumor has it that Ed Murchough, who is still with the Cities Service Refining Company, has left their Portland, Maine, office and is now in Lowell, Mass. We would like to get the dope firsthand. Henry Dooley has left Miami, Fla., and is now with the McGraw-Hill publication, *Electrical World*, at 330 West 42d Street, New York City. Grant French is with the Pennsylvania Railroad, Chicago office. — HAROLD BUGBEE, *Secretary*, 7 Dartmouth Street, Winchester, Mass.

1921

As a result of frequent plaintive appeals for news, we reveled in anticipation of a deluge of letters that would surpass the volume of fan mail on the Supreme Court situation. But a Class Secretary's lot is not a happy one, for what we envisioned as a pile of mail is revealed by the April 1 date of this issue as the spectral image of a type chase without any class notes at all! We shudder to think of it!

Fortunately we were saved in the ninth by a triple play, A. S. Bruna '25 to C. E. Locke '96 to ye scribe, which relates that: "George A. Beeche, after working for several years with the Guggenheims, resigned some three years ago and, for a couple of years, worked a gold mine in Chile. He left gold mining a year ago and is now a partner in a nitrate plant, Beeche y Munoz Compania, Ltd., Tal-tal, Chile, South America. George is crazy about flying and has his own plane. The latest news is that he is going into politics and will be a candidate for the Chamber of Representatives at the next election. Victor E. Stevenson is also in Chile and is now general mining engineer in Pedro de Valdivia, Antofagasta."

S. Paul Johnston's numerous headline activities have been crashing this column pretty regularly. This time the editor of *Aviation* delivered a paper on "Electrical Aids to Aviation" before the transportation group, New York section, of the American Institute of Electrical Engineers, on January 14.

The following item from the Boston *Herald* of January 22 should be captioned "Chemical Engineer Makes Good"! Says this good journal: "Dr. Carl T.

Leander of Lexington, a graduate of Technology and a high honor student throughout his course at the Harvard Dental School from which he was graduated last June, has been named as the first recipient of the Sebert E. Davenport Memorial Prize of the dental school, given in memory of his father by Dr. S. E. Davenport, Jr., of New York City. Award of the prize is made to 'that member of the senior class who during his four-year course is deemed best to have upheld the ideals of the school in loyalty, character, and high scholastic standing and quality of work.' Such an awe-inspiring citation is worthy of prominence in our archives. It is our personal belief that now is the time for all good members of the Class to make a diligent search for an extra molar that can be dispensed with and hasten over to see Carl, to make certain that this young fellow will not lack the pull to continue his meteoric career.

Ray St. Laurent promises us a visit in the near future, as a result of which we hope to glean voluminous notes of the Class from far afield. Meanwhile Ray writes that Albert E. Bachmann sports the title of superintendent at the Missisquoi Corporation, Sheldon Springs, Vt. Al's mail address is 44 Banks Street, St. Albans. — Frederick W. Adams is senior industrial fellow at the Mellon Institute, Pittsburgh, Pa. Freddy can be reached at 4303 Parkman Avenue, Pittsburgh.

A very clever and most welcome announcement, rigged up in true nautical style, steams in after having cleared from The Old Salt Richard J. Spitz and First Mate Dorothy on the top deck of 25 Verdun Avenue, port of New Rochelle, N. Y. Thus the "sails" manager of General Naval Stores, Inc., 230 Park Avenue, New York City, signals the helm of the sighting of the Richard J. Spitz, Jr., launched February 12, tonnage seven pounds. Hearty good wishes to the latest member of our family plus an added welcome to share the natal day with Lincoln and your reporter!

Another welcome announcement, this time from the Institute, advises that John T. Rule is no longer located in Clayton, Mo., but can be found in Room 3-312 of the Great White City on the Charles. Slyly added to this terse memorandum is the brief notation: "'Professor' added to name." This column will welcome a more adequate explanation; John, please note.

As it must to all men, death came on February 3 to Eldridge Bean George of Reading, Mass. To his family we extend, on behalf of the Class, sincere sympathy. Members of Course X who were privileged to know him well during the years we lived together will most keenly feel our loss.

Among our politicians and social leaders we find four in attendance at the January Alumni Council meeting in Cambridge: Chick Kurth, our class representative on the Council; Otto Dahl, representing the Technology Club of Norway; Warrie Norton, representing the Technology Club of Southern California; and Larcom Randall of Satevepost fame,

representing the Technology Association of Minnesota. — Seen at the February smoker of the M.I.T. Club of Northern New Jersey: Max Burckett, Chink Chatham, Cac Clarke, Sumner Hayward, Fred Kowarsky, Ed Lockwood, Art Turner, and Ralph Wersten.

Through the kindness of Dick Windisch, whom we deputized as a sleuth for the occasion, a practical demonstration of good-fellowship with a stein on the table was given at the annual banquet of the Technology Club of New York, February 24. Dick, by the way, is our own Roger Babson and in private life a partner of W. E. Burnet and Company, bankers, 11 Wall Street, New York City. His brother celebrants at the Waldorf-Astoria festivities were Lyall Stuart and Jack Teeter.

This is advance notice from your Secretaries that this column is going on a sit-down strike if you New Dealers and rugged individualists, if any, don't get right down to cases and drop us a post card, note, letter, volume (or what have you?) for publication herein. It's your column and you'll have to give it some news to keep it going. Dictate that note today, or ask the better nine-eights to send in your biography to date! — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Company, Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, 10 University Avenue, Chatham, N. J.

1922

All member of the Class who have developed an interest in matters nautical will be interested in the following article from a recent issue of the New York *Herald Tribune* concerning Harvey L. Williams: "Cape Cod Ship Building Corporation has been sold to a group identified with yachting activities, it was announced yesterday by Harvey L. Williams of Greenwich, Conn., who has been chosen president of the company by the new owners. Mr. Williams said that the purchase of the company occurred after he had been acting in an advisory capacity for a year, directing the company's affairs under the terms of an option. The new owners conducted market surveys and launched the distribution of sailboats through retail stores in major cities during this period. The Cape Cod company was established at Wareham, Mass., in 1896 and is one of the oldest and largest factors in the pleasure craft industry. Under the new ownership the firm intends to broaden its fleet of sailboats to include all types for which there is quantity demand, from children's six-foot play boats to 28-foot cruising auxiliary yachts. More than 30 designs of outboards, skiffs, and sailboats are included in the company's 1937 line. Mr. Williams reported that 1936 sales were more than 150% greater than those in the preceding year, deliveries being made through several hundred retail stores in 37 states. A graduate of the M.I.T., Mr. Williams began with Stone and Webster after leaving school in 1922 and continued there until 1928. Since then he has

1922 Continued

been engaged in corporate reorganization and management in aviation and other industries, serving for two years as a governor in the Aeronautical Chamber of Commerce."

Mr. and Mrs. R. W. Edmonds announce the arrival of a son, Robert Sidney Edmonds, on January 27. It is assumed that Robert Sidney will be of the Class of 1958. — We regret to report the death of Frank J. Connors, II, on January 2. Connors was the youngest captain in the American Expeditionary Force during the War and was cited by General Pershing for distinguished service at Tours, France. He had been connected with Wiley-Bickford-Sweet Corporation of Worcester, Mass., and Anderson Nichols Associates, Inc., of New York City and Boston, and was a member of the board of directors of both companies at the time of his death.

By the time you read these notes, you will probably already have received the first notice from Heinie Horn regarding the 15th Reunion. Such great minds as Heinie Horn, Larry Davis, Eric Hodgins, Harry Rockefeller, and Ray Rundlett have been meeting in New York, with the result that great preparations are under way. The location of the reunion will probably be somewhere along the north shore of Long Island Sound, within easy distance of both New York and Boston. The dates will be approximately June 3 to June 6. If you have not already done so, please reply promptly to Heinie's letter, so that he will be in a position to know approximately how many men he will have on his hands to worry about. We feel that it will not be necessary to urge anyone who is geographically able to do so to come to the reunion. All those who attended either or both the fifth and tenth will certainly be on hand with recruits from the ranks of those who were temporarily embarrassed by the late great downward swing on the chart. Don't forget! Don't procrastinate! Send your affirmative reply to Heinie at once. — C. KING CROFTON, *Secretary*, United Eastern Coal Sales Corporation, 1332 Lincoln-Alliance Bank Building, Rochester, N. Y.

1923

Signs of life in the Boston sector: On February 1, another of the 1923 luncheons at the Boston Chamber of Commerce brought out 21, the best attendance to date. A census of those present, taken by Courses, showed the following: I, Averell, Hendrie; II, Blandy, Golding, Greenblatt, Johnson, Mann, Marder, Russell; V, Gallup; VI, Chandler, Stratton; VI-A, Burke, Carper; VII, Fitzgerald, Proctor; X, Cotter; XIV, Drisko; XV, Bond, Howland. Another luncheon will be held about April 5 — about the time these notes appear. Any 1923 men in Boston who want confirmation of the date may phone me at HUBbard 1630. There is consideration of the possibility of a dinner meeting at Walker in the fall.

Howard Russell's name is on the ballot for class representative on the Alumni Council. Since graduation this office has been held first by Kitty Kattwinkel and then by Bob Hendrie. Both have been

obliged to give the assignment up because of inability to attend meetings. Russell, chairman of the Boston meetings, appears to be a logical successor. He lives in Providence, R. I., but works in Boston and will be able to represent us competently. Your Secretary was helpful to C. P. Thayer in the formation of the Technology Club of South Florida and has been asked to represent that newest Technology club on the Council. The 1923 secretariat is well represented, therefore, on the Council, as Pete Penny-packer is serving on behalf of the M.I.T. Club of Northern New Jersey.

Winthrop K. Coolidge explains the establishment of a new address at 45 East Bellevue Place, Chicago: "I was married on July 20, 1935, at Bel Air, Md., to Miss Laetitia Bredow Kelly, daughter of Dr. and Mrs. Howard Atwood Kelly of Baltimore. Since our wedding trip (through the Adirondacks and up to Montreal and Quebec) Mrs. Coolidge and I have been residing at our present address." — S. E. Duran-Ballen has been living in New York since 1934. He is consul general of Ecuador. — In a letter to Professor Locke '96, A. S. Bruna '25 remarks that Luis F. Buch has been working as general mining foreman for the last three years at Pedro de Valdivia, Antofagasta, Chile. — Al Pyle disclaims any significance in an address change other than a move to be nearer his office at the Ford Instrument Company, Long Island City, N. Y. He reports: "See some boys occasionally. Dick Kleinberger now has his own investment office. Saw Bob Shaw at a special show at the New York Museum of Science and Industry. Bill Glendinning is teaching principles of electrical engineering to classes of professional engineering license aspirants." — HORATIO L. BOND, *Secretary*, 195 Elm Street, Braintree, Mass. JAMES A. PENNY-PACKER, *Assistant Secretary*, 96 Monroe Road, Quincy, Mass.

1926

Alumni Day falls this year on June 7, and the Secretary proposes that on or adjacent to that date this eminent Class assemble for a dinner or meeting. We are itching to show the reunion movie and we understand that others, notably Giles Hopkins, have excellent and probably libelous (and in color at that) shots and are willing to show them. By that time, too, God willing, the class book conceivably may be out to add its meed of scurrility to the pictorial documentation already adumbrated. If there are objections to this proposed addition to the program of Alumni Day, the Secretary would like to have them right away. Otherwise he will call together a few wheel horses and connive some plans for the celebration.

The few days preceding the composition of this scherzo saw no less than five 1926 men drift into the Secretary's littered den: Don King and Hump Barry of New York, George Fogg and Tom Green of Hartford, and Pop Constantine, now of Springfield. Worthies all, and it was a pleasure to welcome them, to note on

their shining brows the hallmarks of success. Don King has been badly bitten by the Frostbite dinghy; he sails and sails in Long Island Sound when he is not making synthetic resins for Carbide and Carbon Chemicals. George Fogg is doing a first-rate job running the Technology Club of Hartford; Pop is with the Foxboro Instrument Company; Hump Barry, with M. B. Suydam Company (paints); and Tom Green — he with the twinkle in his voice and the laugh in his eye — is with the Hartford-Empire Company (glass machinery).

To last month's list of world travelers we wish to add two more individuals for whom the concept of space has real meaning: Richard W. Plummer can be reached care of Industrias Químicas Argentinas "Duperial," Edificio Volta, Av. Roque Saenz Pena 832, Buenos Aires, Argentina; John W. Sanborn is with China Electric Company, Ltd., Shameen, Canton, China. These two have been away from the United States for several years and the addresses we give here are only minor modifications of those they first registered.

From the prolific pen of John E. Nicholas we have two reprints from *Agricultural Engineering* and one from *Refrigerating Engineering*. They are, respectively: "Air Conditioned Poultry Brooder Houses" (in collaboration with E. W. Callenbach), "Farm Electric Milk Cooler with Pneumatic Agitation," and "Pre-cooling Eggs on the Farm." We thought the latter was what happened when the hen got up and walked away, but John has used elaborate equipment, reproduced in half-tones, to explain it to technical-minded readers. — J. RHYNE KILLIAN, Jr., *General Secretary*, Room 11-203, M.I.T., Cambridge, Mass.

1927

Every member of the Class should, by now, have received a detailed account of where and how the tenth reunion is to be held, with a résumé of the scheduled activities on June 4, 5, and 6. A number of individuals have already presumed to formulate schedules of their own, schedules of unscheduled events. They are bound to be entertaining. If anybody has not received the notice and a little card with which reservation is made, he should immediately get in touch with the Committee or he might even complain to the Secretary of the Class. I admonish you again to make your reservations immediately. There are already so many promised that we are beginning to apportion the hard beds and the chairs for sleeping.

The affair promises to be a bang-up good time. The events scheduled should please the landlubber or the saltiest sea-going gob, so that even members of the Class who were forced to join the Navy or the Marines during the depression ought to find their proper atmosphere. In fact (you must forgive my enthusiasm) there is so much evidence of a good time and the event has been so widely heralded throughout the land that there are serious questions raised concerning those who

1927 Continued

have not already accepted. When expected names have not turned up, we have heard remarks like these: "Perhaps the poor fellow has not got married and is ashamed to show his face among the benedicts." Again: "That poor fellow has ten children and can't leave home." I have even heard from a member of the Class who lives upstate: "Why he certainly can't come. The pawnbroker in that town takes his vacation in June." But this is not the worst! It is unfortunate, but, in every event, law and government must be in evidence. The underground member of our Committee has had a letter from Ike Hoover, that movie-conscious G-man, asking for a list of those who refuse to attend so exclusive and joyous an occasion. Of course, the assumption can be only that somebody is racketeering, or maybe several have mislaid their income taxes. So, it behooves all of you, honest or dishonest, married or unmarried, to attend. There is going to be a roll call on the beach. I am sure it will have to be early Friday evening, and woe betide all who aren't there! — **RAYMOND F. HIBBERT**, *General Secretary*, Care of Johns-Manville Corporation, Waukegan, Ill. **DWIGHT C. ARNOLD**, *Assistant Secretary*, Arnold-Copeland Company, Inc., 222 Summer Street, Boston, Mass.

1928

Without a question this month's most engrossing letter came from Dorothy and Bob Hunn who survived Louisville's greatest flood and wrote one of the most interesting eyewitness accounts we have read. Bob said so many relatives and friends inquired about their welfare that he and his wife decided to get out a bulletin to allay all fears. The following paragraphs are quoted from this bulletin: "... Nineteen thirty-seven was destined to be a memorable year. The winter started with a heavy snow that caught the trees still in leaf and tore them asunder with the weight. After this havoc, the weather turned as mild as spring and blessed the country with rain instead of snow. January started with rain and set an all-time record of 18 inches of rainfall, most of which came within one week. This rush of water all over the Ohio watershed poured itself into the river beds and crept up on the unsuspecting towns along the banks. The water rose slowly but steadily, driving out the river squatters, then crept back into the creeks which cut the city of Louisville to pieces, and soon began to take possession of street after street that had never before seen a flood. Stores feverishly hauled out their supplies from basements and first floors, and residents moved a little farther away. On the terrible Sunday of January 24, the river had gone far beyond its record of 1884.

"While boats rushed to help and radios screeched warnings and directions, the rain poured for 18 full hours, steadily and unceasingly. One section of the city after another saw the relentlessly rising water, but many residents watched and said it just couldn't rise any farther. 'It just can't happen to me.' When the

water came over their thresholds, they rose in horror and rushed away by boat, leaving all their worldly possessions to the fate of the river. On Wednesday morning, the river finally came to a crest at the height of 57.1 feet and had flooded 80% of the city with one to 30 feet of water. Only a few tiny islands and three highland residential sections stood out of water and were left to care for all the other areas.

"Bostonians can only picture the situation by imagining the shore line as the bank of a big river that rose out of its bounds, spread the Mystic River, the Charles River, and the Back Bay Fens into immense lakes, cut all the towns into isolated segments and islands, rising over all railroad tracks, cutting off all highways and leaving only Corey Hill, Beacon Hill, Charlestown, a neck of Tremont and Washington Streets, and other small sections above water. Imagine the water drowning out the dynamos of the Edison Company, cutting off all electric power, flooding all basement heating plants, crippling gas, water, and telephone services. Relatives or friends taken from their homes on Newbury Street, Beacon Street, or Brattle Street by boat, would be rushed by train to Worcester or Springfield and would not be heard from for days.

"Thus it was in Louisville and the other Ohio River towns of Cincinnati, Owensboro, Paducah, and many others. Two-thirds of the population of Louisville were driven from their homes, but the marvel of it was that, of all these thousands, comparatively few lost their lives. The great loss was that of property. Estimates are ten million dollars damage to public property alone and one hundred million in public and private property not including millions in stock and furnishings lost. In spite of this, the people are quickly going back to work and to repair their broken city. Years to come we will see a new city rise on the devastation of the old.

"Notes from a diary: Life has been rather chaotic for us since Thursday, January 21. After several rainy days, it was then that Bob's company, Strassel's, began to be threatened by the rise of Beargrass Creek near by. That night, until the wee, small hours, Bob and all the other employees, raced frantically with the rapidly rising water, moving big motors, furniture, and so on, out of the mill. Before they could finish there, it was evident that the office, Bob's drafting room, and the showroom were also in danger, an unprecedented situation in Strassel's history. Before everything could be moved out, the men were wading in a half foot of water in the offices! The next morning was spent moving out the first floor of the finishing room to a storage company's building nearby, trucks backing in through water in the alley as the front entrance was then about four feet under water.

"Strassel's plight began to fade as radio reports started coming in that the West End residential section was being inundated by degrees. The Mayor ordered the city west of 15th Street to be evacuated

and asked residents of the Highlands, Crescent Hill, and Beechmont (the only places that entirely escaped the flood) to open their churches, schools, and homes to refugees. Then began hasty telephoning in an effort to reach friends and relatives in the threatened areas.

"If everyone we invited had arrived, we would have taken in about ten extra people, but no one ever got to us. People were moved so rapidly in trucks and boats that there was no time for personal arrangements. Many were loaded onto trains and taken to outlying towns in Kentucky and Indiana. Some in the central section of the city (which were surrounded by several feet of backwater, literally *pushed* in through the sewers) decided to 'ride it out,' and we have heard many amazing stories this past week how boats carried food and supplies to those marooned; how by sheer determination and ingenuity they invented ways to keep warm, cook, and so on.

"Electric current went off, Sunday, January 24 (the fatal day when it rained steadily for 18 consecutive hours) and only Sunday, January 31, did we begin to have a puny current in our own lights and radio. The artificial gas plant was under water, but natural gas was supplied to the homes not in water. The water pumping station was disabled, and what a terrifying thought that water, rationed two hours daily, would last only a limited time! We used every available tub, bucket, kitchen utensil, and milk bottle to hold water . . . all day Sunday. It was rather sooty, but we cherished it just the same. All water from the mains still must be boiled for drinking, cooking, and dishwashing, although we are now on four-hour rations daily instead of two, since a temporary pump was set in operation a few days ago. Telephones were temporarily out of commission, but now all exchanges are functioning except those still filled with water. There was no gasoline except for relief work, so we could not use our car. Candles were precious and oil lamps even more scarce. We used every candle stub on hand.

"The West End must be a pitiful sight, as there were many very fine homes in that Shawnee Park section. It will be many weeks before the water entirely recedes and the damage is completely cleaned up. The section is quarantined and soldiers (we are under martial law) keep former residents from returning to their homes until the buildings dry out. (This is to prevent epidemics of typhoid, flu, and so on.) All citizens are expected to be inoculated at one of the many clinics so hastily set up all over the city.

"The strain and tension has abated somewhat, but we are still haunted by the agonizing radio calls just before current was cut off: 'Boat needed at 725 South 23d'; '17th and Main, crowd in building about to collapse'; 'boat to 654 South 36th, old man paralyzed'; 'cripple trying to swim. Send boat.' 'Urgent, rush boat; woman in confinement.' Then followed a long list of addresses and more demands for boats,

1928 Continued

taken down as fast as I could write. It was nerve-wracking, as we could never learn whether boats got there or not. . . ."

From far off Chulalongkorn University, Bangkok, Siam, came the following interesting letter written by Charles M. Gewertz, VI: ". . . You may already know that in 1930 I returned to M.I.T., after about a year-and-a-half of work with the National Electric Light Association, and secured a D.Sc. degree two years later. In July the following year I married a young Swedish-American girl, Miss Ruby Wahlmark, daughter of Mr. and Mrs. Oscar L. Wahlmark, Rockford, Ill., and had a wedding trip (visiting 13 countries, including Greece, Turkey, Palestine, and India) to Siam, where I had been appointed professor and head of the electrical engineering department of the College of Engineering, Chulalongkorn University. We like it so well here that when the old contract expired a few months ago I accepted a new one, but next spring we are making a trip to Sweden (Mrs. Gewertz will also visit America) in order to do a month's military service and to get the blood a bit 'thickened' after having been living in a country with nearly perpetual sunshine. I may add that M.I.T. is very popular in Siam and this year all the engineering students who secured government fellowships for study abroad were sent there, so they can tell you more about this rapidly progressing country."

Phil Taylor, X and X-A, is in charge of the control and development laboratory of the Woonsocket Rayon Company and he is quite enthusiastic about the progressiveness of this organization. He says: "I find the work interesting because it uses all my abilities, and I have adequate materials, apparatus, and men to do the work — things dear to the heart of an engineer." Phil was married in September, 1933, and is now living at 25 Glen Road, Woonsocket, R. I. — GEORGE I. CHATFIELD, *General Secretary*, 5 Alben Street, Winchester, Mass.

1931

Most of the information at hand just now comes from Professor C. E. Locke '96, who has the happy faculty of handing over precious bits of news just at the moment when your Secretary thinks he is to be stranded. Incidentally, while on the subject of the source of our notes, it might be brought to your attention that for this particular issue those outside this fair land of ours are much more articulate than those within. Maybe some of you fellows who must have an explanation for all things unusual can see the ultimate breakdown of democracy in the indifference of our classmates in the welfare of one another in these United States, or maybe it's just another evidence that freedom of speech in our country is being stifled by some insidious, unseen force.

A letter from A. S. Bruna '25 to Professor Locke states that Eugene Gonzalez

worked for some time in Pedro de Valdivia, Antofagasta, Chile. "He has had many ups and downs and just now I think he is up, having inherited a lot of money." — Speaking of ups and downs, your correspondent is in receipt of information concerning the whereabouts of Gaspar Vizoso. If he had any ups while in or about Madrid, he evidently came down all in one piece, for his present address is Oficios 18, Havana, Cuba. By the time the next issue of *The Review* goes to press, I hope to have a letter from Gaspar confirming my guess as to his health and telling us something about the war in Spain.

Godfrey H. Vivian, III, consulting mining and metallurgical engineer of Camborne, Cornwall, England, is temporarily at the Mines d'Or de Litcho, Sunei Golok, South Siam. The ore is a decomposed granite and some of the gold is free and some contained in sulphides. A pilot mill for amalgamation is in operation and a flotation-cyanide plant is under construction. In the first year, £70,000 worth of gold was recovered by amalgamation and about £20,000 worth of concentrate accumulated. Transportation is by elephants. — Getting a little closer home we have an excerpt from a letter from Arnold A. Smith to the Alumni Association: "My address is now 1121 St. Paul Street, Three Rivers, Province of Quebec, Canada. I'm assistant steam superintendent at the International Paper Company mill here and not yet married (if that happens to be of interest to anybody)." — From George Morrill '27, Register of Former Students Office, comes the information that Wallace E. Niles received his S.B. last December.

A few scattered items about members of Course XV: Johnny MacBrayne has recently taken a job with Marshall Field Company in New York; Johnny Smith, recently married, is now a certified public accountant in Boston; Ed Worden has moved to Chatham, N. J. Lost, strayed, or stolen: Jack Wilkinson; last heard from somewhere in Florida. — BENJAMIN W. STEVERMAN, *General Secretary*, 11 Glenland Road, Chestnut Hill, Mass.

1932

Fifth reunion! It is the subject of vital interest to all of us. At the time of writing this, there is little I can add to what appeared last month. Plans are still being formulated under the direction of Tom Sears and his committee. To borrow the phrase of the radio announcer who is hard pressed for material: "Take it, Tom." "Thanks, Chippy. It is with considerable dismay that we look around and find the slowly graying heads, even higher foreheads, and an occasional monkish bald spot, and remember that we have no secure hold on this nebulous claim to fame, for upon peering through our now misty eyeglasses we behold our Class — the depression babies — budding tycoons of industry. But 'hence, loathed Melancholy, of Cerberus, and blackest midnight born,' for we of '32 are once again descending upon Cambridge from the four corners of the earth, for-

getting our graying locks and balded pates, to make merry as of yore and show the Institute that '32 is still very much on the map.

"While the foregoing will probably bring many a scowl from Bill Green and his confreres, it is just a sample of the jubilation prevailing the men of '32 upon the thought of our fifth reunion. Your committee is slowly taking form and shape and is carefully combing the many details which will make your reunion an outstanding event. You may expect to hear from us shortly with the detailed plans. But in the meanwhile, remember it is the 5th and 6th of June, and we're expecting to break all attendance records for fifth reunions. So mark your calendars for June 5 and 6 and tell the boss you have a date with the men of '32 for that weekend. We'll be seeing you. Take it away, Bound Brook."

Thanks, fellow. Now I'll return to a little news that has drifted this way: James G. Ritchey has left the Dennison Manufacturing Company in Framingham, Mass., where he has been since graduation, to join the Schlumberger organization in connection with prospecting for oil wells. James, Esther, and son John Paul are all flourishing excellently. This communication was sent by courtesy of F. Alexander Magoun '18.

We certainly were pleased to hear from Rolf Eliassen and receive news of his coursemates. His letter in full is quoted below. — How about the rest showing some real interest in this Class of ours? Write me a note about yourself or, if you are a modest soul, about some of the fellows you hear about. Write suggestions for the reunion. Write anything — only break this silence! — CLARENCE M. CHASE, JR., *General Secretary*, 410 Church Street, Bound Brook, N. J. CARROLL L. WILSON, *Assistant Secretary*, Room 3-210, M.I.T., Cambridge, Mass.

COURSES I AND XI

Greetings to the most silent class in the history of the Institute! What's the matter with the bohunks of our Class? Are they afraid to open their mouths? Come on, gang, we're anxious to know what you're doing. — I'm working in Chicago now and have had a chance to exchange notes with Chuck Thayer. He's employed as an estimator for Montgomery Ward and Company and travels all over the country, from Maine to California, making estimates on the cost of installing "Monkey Ward" retail stores in various buildings in the cities he visits. Chuck has a wife and a baby girl a few months old, so you can bet he's glad to get home once in a while. The home address is 1725 West Thorndale Street, Chicago, Ill. — Louis Jones is also a "Monkey Ward" man, working in the same department as Chuck and likewise an extensive traveler. Jones is also a proud papa.

When last heard from, Don Henderson was working in Oregon at a mining job, but was planning to switch to some sanitary engineering work in Oregon. While mine surveying Don was pretty badly

1932 Continued

injured by a fall. An attractive nurse helped bring him into good health again, so don't be surprised if you hear of more developments in the affair of Don and the nurse. Engineering is sometimes a dangerous occupation, so a nurse at home can be a great help. — Bob McGilvra is also out in Oregon as an inspector on bridge construction for the Oregon State Highway Commission. A recent picture of a large bridge opened with great ceremony showed Bob as one of those helping in the successful completion of this project. Nice work, Bob!

Last July Bob Thompson went with the same company I've been working for since last February: The Dorr Company, Inc. After two months in the research lab at Westport, Conn., Bob relieved me out at Sioux Falls, S. D., where he worked for two months, running experiments and operating an activated sludge plant. Then he went to Cedar Rapids, Iowa, to do more experimental work until Christmas. Since then he's been operating a sewage plant at Ortonville, Minn., with lots of snow and sub-zero weather to remind him of his native Maine.

After leaving Sioux Falls in October, I spent almost two months in Detroit, running experiments on hydraulic models of some of our equipment. Since the work was for the city of Detroit, we were working in the city college, Wayne University. It seemed strange to be back in school again. To add to the old M.I.T. atmosphere, I found our old steam lab instructor, August Hesselschwerdt, teaching steam lab, hydraulics, and air conditioning at Wayne. After a couple of years on design and installation of air-conditioning equipment for York Ice Machinery, he's gone into teaching again. — To continue with my story, after Detroit I went to Blissfield, Mich., and ran some experiments at a beet-sugar refinery. Then I worked in Battle Creek and Jackson, Mich., at their sewage plants and before Christmas landed in Chicago. Since then I've been stationed in the Chicago office doing all sorts of things in connection with sanitary engineering jobs for which our company is supplying the equipment. Once in a while I get up into Wisconsin, Minnesota, and North Dakota, but I'd rather stay away from those places in midwinter. I'm in the office most of the time so if any of you get to Chicago, don't fail to look me up. In the meantime, let's break this long silence and write. — ROLF ELIASSEN, Secretary, The Dorr Company, Inc., 221 North La Salle Street, Chicago, Ill.

1933

A letter from V. O. Bowles tells that he has recently discontinued his services with the Humble Oil and Refining Company and is now with the Lummus Company with offices at 50 Church Street, New York City, employed as a chemical engineer, and specializes in the design of refinery equipment. He was married to Miss Dolores Forbes of Baltimore last April and is now living at 7½ Leroy Street, New York City. — A line from

Bretton Perry tells of his employment by the American Can Company and of his transfer from their Austin (Ind.) plant to their Tampa factory. His latest address is 334 Hyde Park Avenue, Tampa, Fla.

A letter from the Register of Former Students Office advises us that William MacGregor Murray received his Sc.D. and Dayton Harris Clewell received his Ph.D. last December. — There was an article in the *New York Times* on January 6 describing the findings of Charles Collier after a South American survey for the United States Soil Conservation Service. Here is a part of the item which I thought might be of interest: "... Mr. Collier, a graduate of the M.I.T., said the survey party traveled in a light automobile equipped with wide wheels. They started at Valparaiso and traveled 7,000 miles through the jungles and mountains of Chile, Peru, Argentina, and Bolivia. They found highways 'fair,' but on occasion it was necessary to cross rivers and swamps by raft. He said their greatest thrill came when they were skiing on the side of a volcanic mountain. Hearing a deep rumbling sound, they fled on their skis as far as the snow lasted. It brought them down to the very edge of tropical vegetation. Mr. Collier added that he would return to Washington immediately, to report to the Department of Agriculture."

From the society columns we have the following wedding announcements: Dr. William Leo Walsh to Miss Grace Croshaw on February 6 in Maplewood. Walsh is at present employed as research chemist for the General Aniline Works of Rensselaer, N. Y. After an extended honeymoon, the couple will reside in East Greenbush, N. Y. — George William Denison was married to Miss Dorothy Marion Wood on January 8 at Stoughton.

Herbert Spencer Gardner, Jr., is engaged to Miss Agnes Forschew Schlegel of Scarsdale, N. Y. They plan to be married next summer. Raymond W. Smith and Miss Olive A. Dunbar of Methuen have announced their engagement, as have Phelps Kilborn Tracy and Miss Eleanor Carr Phillips of Newton Centre. Tracy is at present affiliated with the Foxboro Company, and plans to be married in June. — GEORGE O. HENNING, JR., General Secretary, 330 Belmont Avenue, Brooklyn, N. Y. ROBERT M. KIMBALL, Assistant Secretary, Room 3-107, M.I.T., Cambridge, Mass.

1934

Spring is here and with it come birds, bees, flowers, engagements, marriages, and poison ivy. To say the least, it is difficult to get spring fever in the middle of February, even though we've had no winter. Your Secretary will have to be pardoned if in the notes certain anachronisms appear from time to time. The reason for these literary lapses is the fact that class notes have to be submitted some five weeks ahead of the date on which they appear. Letters which you fellows have started to write are greatly appreciated, but don't feel badly if a choice piece of

hot gossip doesn't appear for several months. The mailman was telling me that from the size of my daily mail I must be a very popular young fellow. I countered by saying that he hadn't seen anything yet and that he'd better buy a new and larger mailbag. Incidentally, to make that good, I'm relying on you fellows to take the ten minutes necessary to sit down and let me know just where you are, what you are doing, whether you are married or not (or engaged), who your employer is (if any), and with what other 1934 men you come in contact.

Kevin Malone (K. Malone to the track-house boys, because he rarely did) is living up to his Tech training in fine style; he is a Course III man who stayed in mining and is at present at the Surcease Mine in Oroville, Calif. He is surveying the traverses for causing two blind tunnels to meet underneath a mountain with deadeye accuracy; handling sampling work, mine accounting, cleanup of gold precipitate, and the prospecting for proposed locations. He writes to Professor Locke '96 that the experience is excellent and he enjoys the work.

From New Rochelle, N. Y., I received a fine letter from Bob Moody, XIII-C. Bob is with the General Motors Export Company at New York City. The company has placed him in various departments in order to familiarize him with all phases of the work. At present he is scheduling shipments to foreign subsidiaries and dealers in Southern Europe and Northern Africa. I hope he doesn't send any fine Italian leghorn seat covers to Ethiopia. The only romance in his life is a she about 15 to 20 feet long, equipped with sails. Bob will have to be a darned good pilot if he can keep away from Matrimonial Harbor, boat or no boat. He writes that Johnny Wood, XIII-C, is working with the Ingalls Iron Works Company in Birmingham, Ala., in the marine department. — Jim Eder is with the American Radiator Company, having favored the U.S.A. over the Canal Zone. I hope Jim will send his company's stock up to 30 soon instead of leaving it around 28 to 29 most of the time. Bob continues: "Gordon Burns is living in Maplewood, N. J., and is working with the Western Electric Company. Freeman Hudson, X, is working with the Colgate-Palmolive Peet Company in Jersey City, N. J. Red Emmons is living in Charleston, W. Va., working for the Carbide and Carbon Chemical Corporation. He has been married to Miss Barbara Southall, Smith '35, for over a year." (Secretary's note: This proves that some Tech men don't marry Wellesley girls.) To continue with Bob's letter: Harry Humphreys, XIII-C, is in New York City working for the American-Hawaiian Steamship Company; Ben Fisher, also XIII-C, is with the Grace Line; and Bill Leete, II, is with Veeder-Root, Inc., in Hartford, Conn.

George Best, XIV, will, I believe, be tied with Bob Moody and Charley Parker for contributing one of the best letters of the month. George writes that he met Henry Kawecki, XIV, and after several positions with various companies, Henry

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has located finally with the Beryllium Corporation, developing electrothermic methods of producing beryllium-copper. — Stan Knight, XIV, is located in New Bedford, Mass., with the Continental Screw Company, doing high-pressure engineering on all problems which come up. George writes further that Syd Nashner is located in Hartford, Conn., with the Underwood Elliott Fisher Company. Hartford, due to the insurance companies there, is supposed to be flooded with beautiful damsels. Syd, however, says that he has not become vulnerable yet. Mert Neill, musical club xylophone expert, is busily engaged in patent work on oil refining processes with the law firm of Pennie, Davis, Marvin, and Edmonds in New York City. George, himself, last but not least, is hiding away, he claims, in the small town of Palmerton, Pa. The New Jersey Zinc Company at present is being favored. His work commenced with laboratory research but has changed now to plant development. He is teaching chemical calculations in night sessions. More power to George if he can make all his valences, ions, and so on, come out even on both sides.

Effective February 1, Robert C. Becker was appointed assistant secretary of the Class. His address will be South American Development Company, Apartado 655, Guayaquil, Ecuador. Effective the same date, William G. Ball, Jr., was appointed permanent class secretary and a member of the Alumni Council, representing 1934 at the monthly council meetings. All communications regarding class affairs involving class notes or the duties of the Secretary should be addressed to the latter at 18 Ware Street, Cambridge, Mass. Bobby Becker dropped in to call on your Secretary about February 1 and we had a fine old gabfest. He is certainly bitten by the mining engineering bug and has departed for South America to be a mine foreman. Tuffy Emery, Larry Stein, Al Rogowski, Barney Freiberg, Milt Brooks '36, and Bud Pflanz '35 were at the boat to give him a send-off. I hope the captain didn't have to fly fog signals on account of the Scotch mist.

Turning to our clippings and announcements, I find that old Danny Cupid, as I am getting to call the little devil, has been hard at work. The *New York Times* says that Dorothy G. Martin, daughter of a prominent banker, has become betrothed to John Bartol Dunning. Course XV fellows remember Jack as a Gene Raymond double, the terror of the Theta Chi house parties. Paramount Pictures apparently missed the boat because Jack is with the Corn Exchange Bank Trust Company of New York City. — Robert M. Elliott, VIII, has become engaged to Miss Barbara Hicks of Chicago. Wellesley College (again) was the place where the young lady completed her undergraduate work. She is at present studying at the Katharine Gibbs School of Boston. Bob is taking his Ph.D. at Technology. — The *New York Herald Tribune* informs us that Mrs. Stephan Hollands has announced the engagement of her daughter, Miss Christine Hollands, to George R. Struck.

Miss Hollands is a graduate of Abbot Academy, Miss Wheelock's School, and Boston University. The wedding, I believe, has taken place, although no news articles have reached me on the matter.

Here in Boston we learn that W. Olmstead Wright, II and Delta Upsilon, became engaged to Miss Marie Sholz of West Medford, Mass. Miss Sholz is a graduate of Wheaton College. (Another fellow eluded Wellesley, apparently.) Wright is now an inspection engineer with the Associated Factory Mutual Fire Insurance Companies in Boston. — Purdue University informs me that Jerome Raphael, IV-A, is an engineer on the Tygart River Reservoir Dam at Grafton, W. Va. Albert E. Heins, XVIII, is teaching mathematics at Purdue University. I herby accept your offer, Al, and shall expect you to drop in next June. — Speaking of mathematics, I'd like confidentially to know how many 1934 men can still integrate $\sin^2 x \, dx$ without looking at Woods and Bailey, wishing that they had listened to Douglas, Passano, and Company more intently. — C. A. Tudbury, VI-A, has been appointed an instructor in the department of electrical engineering at Fenn College in Cleveland, Ohio. — James R. Andersen, graduate student in 1934, is completing his maintenance navigation flight which will give him the army ratings of airplane pilot and airplane observer in the Air Corps.

Next month I hope to be able to announce a list of course secretaries and local resident secretaries whose small task it will be to gather little, juicy tidbits for your hard-working Secretary. However, I am looking for volunteers to assume the job in their Courses or cities, and to these I shall give much credit. In The Review they will receive authorship credit for work submitted. My reason for inaugurating such a system is this: I feel that 1934 should receive its share of alumni representation and that to further the cause you fellows should be glad to get behind the move and occasionally forward short accounts of goings on in your Course or your city. I want you who meet in each city to get together and elect a representative who will write me regularly about your group. If necessary, rotate the job. City groups of this sort should be an excellent means of getting M.I.T. men together for mutual social and business benefits. I shall look for elected city secretaries to write me immediately following the publishing of these notes in April, telling me the city each represents and the fellows covered. Any suggestions for encouraging a finer M.I.T. spirit and a lasting loyalty to the Class will be greatly appreciated. — WILLIAM G. BALL, JR., *General Secretary*, 18 Ware Street, Cambridge, Mass. ROBERT C. BECKER, *Assistant Secretary*, South American Development Company, Apartado 655, Guayaquil, Ecuador, S.A.

1935

From the papers we have a few marriages and a birth to announce. Eunenia W. Campbell and Elliot Ruckman were

married in January. — Mabel Hickman and Jack Flaitz were joined in wedlock, January 28. — Ruth W. Cook and John Cheney are engaged, as are Martha Nicolson and Bill Bennett. Melville Charles Brown dropped me a line to say that his proud parents are Gladys and Murray Brown. He seems to be corresponding at an early age, having entered this topsyturvy world last February. Best wishes from the Class to you happy boys and girls.

Turning to the letters of the last month, I think that I ought to take down my hair and weep. Trouble is, it would probably be to no avail. Three letters and one post card are the sum total for the month — that's coöperation for you! Ask yourselves who is to blame for the lack of news. Having eliminated the sob stuff from my system, I'd like to mention that Bernie Nelson is still plugging away for New York Telephone and Telegraph, as is George Bull. Bernie is now in a little town in western New York called Little Valley. He says that it consists of two intersecting streets and a group of buildings. Bernie still finds the line-maintenance work interesting and he likes the fresh-air work. (Look out Tarzan!) He has been spending his week-ends in Buffalo, where he sees George Bull occasionally.

Eddie Woll did his bit this month by sending some news about Course II. Here is his story: "M. K. McLeod delivered a paper on 'Engine Friction' before the Society of Automotive Engineers in Detroit last January. According to reports the paper was well received. At present McLeod is an assistant in the automotive engine lab at school. The two reticent Georges of Course II have been Forsburg and Kevorkian. Since graduation Forsburg has been stepping around from Hyatt Bearing in New Jersey to B. F. Sturtevant in Boston to Lynn General Electric, and is now working in the engineering department of the Portsmouth Navy Yard where submarines are now under construction. The other George worked at the offices of Metcalf and Eddy in Boston. From there he went to Hygrade Sylvania in Malden. According to the last report he was working in the office of the plant engineer." Many thanks, Eddie.

A letter from Walter Wallin (Buffalo) gives some news about a few of the lads. . . . Gradually I'm finding some interesting people, but it certainly is a slow process. Jud Briefer is working here as resident engineer for Liberty Mutual. He and his wife (formerly Florence Dana) came to this burg last summer and the three of us have been doing our collective best to tolerate life among the Buffalonians. Howard Tatel has an assistantship at Stanford. He went home to Boston for the holidays and stopped at Buffalo en route. I must have been gadding about that particular evening because I was not in. However, I went home for Christmas and returned his call. Howard is certainly enthusiastic about California and is very much absorbed in his work. George Valley and Ralph Woolf are probably wondering why I have not

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been to Rochester or written lately. The fact is that I've found very interesting companionship in the person of a Miss Sally Short, and that has been very effective in keeping me in Buffalo week-ends and on the go evenings. (Secretary's note: When shall I make the announcement, Walt?) And my work — that has been the one redeeming feature of living here. I'm spending most of my time designing microscope objectives and I meet some interesting problems." (Secretary's note again: Don't let Sally see the crack about the only redeeming feature or I may have no announcement to make.)

The only remaining contribution is a post card from Bob Madden. It seems that Bob got down on bended knee a short time ago and is just waiting for the bank account to become larger. At least he had the filthy lucre to get a ring. Bob has been with Bethlehem Steel since graduation and has had a whole series of jobs in the metallurgical department. He likes the work and is planning to do some more studying along the same line.

As for myself, I've been studying diligently (?) at the Graduate School of Business Administration of Harvard since February 1. The work is very interesting and I expect to gain a lot of good training between now and June, 1938. Jack Burton is in the class ahead of me and is going strong. I've been over to Tech a few times and run across a few of the boys. Ogorzaly, Epstein, and Dauphiné are doing graduate work. Otto Zwanzig dropped in about a month ago during a trip from New York. He is still the high-powered salesman in the utility field. Dick Lawrence has been up to his ears in work, but gets time to attend the Alumni Council meetings at Walker Memorial. That's all I recall, having been too impractical to record things as they came to my attention. Thus end the smallest number of contributions since we started. Ninety-nine and forty-four one hundredths per cent of you owe me letters and had better get busy before the column gets down to zero. — ROBERT J. GRANBERG, *General Secretary*, Hamilton D-32, Soldiers Field, Boston, Mass. RICHARD LAWRENCE, *Assistant Secretary*, 111 Waban Hill Road North, Chestnut Hill, Mass.

1936

Several letters this month give interesting news about members of the Class. More engagements and marriages, a few more of the gang working, and a couple of fellows getting mixed up with labor strikes are the headlines of this month's issue. Without further ado, then, let's see what the mails have to offer!

Course I. Elliott Robinson is still picking up teaching experience as a substitute in the Brockton High School. He manages to put in several days a week and some weeks he has worked steadily. Accordingly, he hopes to find a regular teaching position next fall on the basis of the experience he is now securing. Moreover, his spare time is spent in tutoring and working for his father. Elliott received a letter from George Payne, 520 East Ninth Street, Chester, Pa., with the following:

"I lived in Upper Darby (Pa.) for two months after graduation, working as a draftsman for a consulting engineer in Philadelphia. Then I shifted to the Sun Oil Company in the construction end as engineer's helper in Marcus Hook (Pa.), and I've been there ever since. It's about 12 miles to where Bob Worden was living and I used to get to see him now and then. He is over in Camden, N. J., now, and I am going over tomorrow night to see how he is making out in married life. (The account of Bob's wedding is given in last month's Review.) I've done a lot of traveling in my Ford, 'Shasta.' Besides a trip to Cleveland, I've been to Boston once, New Haven many times, Jersey Shore a couple of times. My last escapade was a trip after Matty (E. Winston Matthews). I got an announcement of his marriage in November and chased him up the latter part of January. Went down to Pocomoke City, Md., to his family and from there to Baltimore. He has a very nice wife and they live with her family. He is still going to school — studying aeronautical design. He works for the Martin aircraft people and seems to like it. As for me, I can't kick. I've been awfully lucky outside of getting bad moments walking high steel works and pipes. They pay well, and most of the time there is very little to do. I miss the old town of Boston, but am having my fun."

Courses III and XII. From Stan Johnson, 718 South Linden Avenue, Pittsburgh, Pa., comes a good account of this group. Stan writes: Wally Mathesius is still working for United States Steel at the research lab in Kearny, N. J. Since the smoke and fume of Kearny was so thick, Wally was forced to move into the more refined sections of South Orange. Starting work the day after Labor Day, he has been playing Sherlock Holmes ever since. He reports that he is investigating the short-time, high-temperature properties of several steels. Sounds like another thesis — and just as much work. To quote Wally: "As with any investigation of this sort, we have run into a number of difficulties, and, for my part, I have sacrificed my share of brain cells in wrestling with these problems. Other projects on which I have worked include investigation of atmospheres in controlled-atmosphere heat-treating furnaces along the line of J. P. Gill's work as reported in his recent Campbell Memorial Lecture, research on certain aspects of the direct transformation or 'austempering' process developed here at the laboratory, work on the behavior of low-alloy chromium and molybdenum steels in the three-phase region, and miscellaneous problems of grain size, microstructure, and corrosion. Of course, I have learned much at a fairly good rate of speed, and strangely enough, I have often dug back into all kinds of textbooks, such as applied mechanics, physical chemistry, hydraulics, and even calculus! I still don't know how to integrate, though, any more than I ever did."

Re Horner and Ford Boulware were both working for the United States Smelting, Refining and Mining Company in

Bingham, Utah, when the miners went on strike. It's an old story that Ford fought with the conservatives to help break up the strike, while Re got disgusted with the mess and accepted a good offer to work as junior geologist in the tin-silver mines of the Cia Minera Unificado del Cerro de Potosi in Potosi, Bolivia. It is rumored, but denied by Ford, that he got his head "cracked in" during the strike. Wally Mathesius reports that Ford and Re decided to go on a deer hunt one fine day during said strike. Re, with his customary nonchalance, poked his blunderbuss in the general direction of Nevada, and lo, when the smoke had cleared away, there lay a deer! Ford, though he scoured the plains and tirelessly climbed the cliffs never even saw a rabbit, let alone a deer. Before going South, Re returned East to spend Thanksgiving with his family. Later he went on to Boston to see Wally Mathesius and others. This is the impression Re made on Wally! "Boy, he was rustic as hell, a rip-roaring prospector, trailing revolvers, shotguns, mining helmets, woolen underwear, and mud all over the place. The equipment he bought for his three-year stay in Bolivia included enough stuff to outfit a *safari* across the Sahara or a Little America expedition. He is going to be in Potosi, Bolivia, which, from all I can see, consists of naked rock, Indians in a similar condition, and little else. Re sailed via the Canal on December 11 and is now safely located in Bolivia. He says he is not only disappointed in the countryside, but he 'deplores' the lack of women who understand him. At the present time he is computing tonnages in the main office, but it won't be long before he must use his geological knowledge in the mine proper. Since it is reported that they would rather lose a life than pay for more timber to make a safer mine, all we can say is: 'Do be careful, Re, and when you come back, don't bring the mud.'"

Ford Boulware writes a long, interesting letter, in which he gives information about everyone but himself. A very sage bit of thought flows forth, however, as Ford philosophizes on the recent strike in Utah: "I have found that men who join unions lack not only intelligence but courage and honesty as well. Perhaps not so much the rank and file — who are but sheep — but their leaders. If a man is afraid to face the world alone, he runs to a union to whine about it. They put false statements in the papers to enlist public sympathy and try their very best to intimidate nonunion men. If anything is to impede progress, it is radical communistic unionism. Nice country here, though!" (Those are pretty harsh words, Ford. Perhaps you are slightly prejudiced.)

Johnny Pappas has been working for Wickwire Spencer Steel in Worcester, Mass., since July 27. After spending the first ten weeks in a training course at Buffalo, N. Y., he returned to work in the lab at Worcester. Since he works only five days a week, he comes home every week-end to see that a certain miss

1936 Continued

doesn't get a chance to miss him. The company recently sent Johnny to attend a three-day Symposium on Metals of the American Institute of Physics held at M.I.T. He reports that many prominent metallurgists, such as Edgar C. Bain, Zoy Jeffries, V. N. Krivobok, John T. Norton '18, and Francis Bitter, attended and delivered papers. — Lew Gelbert is with Inland Steel in Hammond, Ind., while it is reported that Mr. and Mrs. Felix Stanley Klock are living in Hartford, Conn. The former is working for Hamilton Propeller. — George Bair is busily engaged with research work as well as instructing at the Mellon Institute, Pittsburgh. — John Petroskas has a position with Bethlehem Steel at their plant in Sparrows Point, Md. — Mike Kuryla has his degree now after finally passing elements of electrical engineering and one or two other courses. He planned to go down to Utah and join Ford Boulware for a few weeks. Who knows, it may be a honeymoon, for it has been reported by several reliable sources that Mike is "deathly in love."

Course VI-C. Jack Cook, still a deserter to Harvard, says: "Surprise! here's some news." He writes a short note to tell it: Tom Brown's fellow *voyageurs* on the Thorne-Loomis tour in the summer of 1935 will recall his undue worship of the American Express offices from Amsterdam to Dresden. He was looking for letters from Miss Marion Dwyer. Well, last January he married the girl. Tom left Jackson and Moreland in January to go to work in the labs of the Hygrade Sylvania Corporation (vacuum tubes and light bulbs) in Salem, Mass. As to Mr. and Mrs. Brown's plans for the future, Tom hasn't told me. Ray Svenson is also with Hygrade. It must be a great company; 75% of its engineers are Technology men.

Rumors are: Joe Gratz is sound effects man at the New York studios of the Columbia Broadcasting System; Al Dasburg is with the Baltimore and Ohio Railroad; Harry Pekin has left Danvers, Mass. (Champion Radio Works, not the asylum), to go to work for Tung-Sol Lamp Works in Newark, N. J. I'm alive, but kicking less. (We doubt that!) Harvard looks better now. Met Walter Lane, XV, in the Harvard Yard yesterday; he is studying economics here.

Course VII. The only news from this group comes from Ed Knight who writes below the letterhead of the Arizona State Board of Health: "Ever since I've been here in Arizona I've been intending to write and give you an idea as to just what I'm doing out here in the land of desert and cactus plants. The truth is that I've been so darned busy getting acquainted with people and my work, enjoying Arizona sunshine and mild weather, and trying to establish myself in general, that the seven months I've spent here have flown by as if they were only a few days. As assistant sanitary engineer, I spend my working hours about equally between office and field work. In the office, I assist the chief sanitary engineer, Mr. F. C. Roberts, in the solution of

various problems that arise, while in the field I make sanitary investigations of water supply and sewage disposal facilities, investigate various requests for field inspections, and participate in general public health work that comes within the scope of the sanitary engineering division. I might add that I'm fully enjoying my work and am very grateful to have the opportunity to work here. . . ." Ed doesn't say what he does with his nonworking hours. We are led to assume that he spends them "getting established."

Course VIII. Charlie Evans, 59 Gorsline Street, Rochester, N. Y., hopes to compensate for the lack of news last month by the relatively large amount at hand this month. May as well start out with a bang and quote parts of a letter from Ken Cook up in Glenclyff, N. H.: "In the first place, I'd like to make this an opportunity to thank the fellows of '36 who made me a gift of the *Technique* last May. It was indeed a swell feeling to realize that some of the fellows remembered the guy who, of necessity, slipped so unobtrusively out of school in April, 1935. . . ." Ken also says that he has news from our friend, Wee Willie Hazen. It seems that Willie has named his sailboat *Quantum*, and has done right well by himself in racing. Just to feel at home, though, he gets into a jam every once in a while, from which he has to be extricated by the coast guard. (I wonder what a *Quantum* looks like when it's upside down.) In closing, Cookie says: ". . . I am beginning to get back on the ball once more, but, of course, I am still in the process of curing, which is always very slow even at its best." He'd like to hear from the fellows; his address is given above.

After that bit of good news we have some more from Dick Morton who says, in a note on the back of a Christmas card (are we still getting last year's news?), that he is now teaching math and science classes at Monson Academy, Monson, Mass. Nice work, Dick. — Art Cohen has been doing some hopping around since we last saw him. Right after the close of school, he took a couple of weeks off (for good behavior, no doubt) and then started looking for a job. He landed one his first day out! This job was in a microphone factory, where he did testing and designing. After a couple of months spent there, he started looking for a job nearer home, and again landed the first one he looked into. (Cheer up all you guys, business is booming.) This job is with the Ward Leonard Electric Company, Mount Vernon, N. Y. A. M. sounds very enthusiastic over it; in fact he says that the job couldn't be more satisfactory.

Another brief note, this one from the other Cohen, is also at hand. Business with L. P. is apparently picking up; he has had a raise, so it looks as though he has started going places. I suppose he carries two newspapers with him now instead of one. — Carl White is in under the wire again and sounds very cheerful about his job and life in general. In his spare time he is studying radio and doing

some writing. Let that be a lesson to you, fellows. He claims he caught a green electron the other day, but I won't believe it even if I do see it. Also we won't have to watch the death notices any more. Instead of buying a 1931 Ford Tudor, Carl bought a '36 Tudor instead. At the time of his writing it was all nice and shiny black and chromium. — My own job at Kodak Park is proving to be as interesting as it looked at the start. This industrial research is certainly great stuff once you get into the swing of it. That's all for now. Here's hoping there'll be as much good news next month.

Course XIII. Art Wells, Jr., 212 William Street, East Orange, N. J., has been saving up his news for several months now, I guess, and gives it to us all in one big dose: A recent letter from Ed Rowe gives us a pretty complete picture of what Course XIII is doing at Newport News. Ed himself is now a staff supervisor in the steel hull division, his job consisting chiefly of scheduling the various types of work and seeing that the work is carried out on schedule and with the approval of the navy inspector. — Johnny Graham, who is located in Newport News's hull drafting department, worries about how and where pipe lines are to pass through bulkheads. — Warren Sherbourne, Jr., is also in the hull drafting department, his work being in connection with weight estimating. — Gordon Donnan, who began work last summer with United Shoe Machinery, thought better of this heresy and returned to the shipbuilding game in November. He is now staff supervisor in the welding engineer's office. Recently, the work has given him problems concerning the welding sequence on the navy ships now under construction, particularly on the light cruiser, *St. Louis*. Ed and Sherb are keeping house with a couple of other naval architects from Webb Institute, and these industrious lads while away the spare hours designing Moth Class boats which they hope to race next summer.

Alden Anderson is now working with Peabody and Lane, Inc., in Boston and suggests that the steamship agency business is "the wildest and busiest that exists." However, he finds his job as assistant to the dock superintendent interesting enough not to mind long hours now and then. — Alwyn Gray crashed through with a newsy letter the other day. He is working for Sun Shipbuilding and Drydock Company and is at home at the Y.M.C.A., Chester, Pa. They call Al a berthing inspector and have given him the job of passing on the tightness of seams and contiguous pieces before riveting. Al speaks of the recent strike at the Sun Shipbuilding plant. When the non-strikers crashed the picket lines after being kept out of the plant for four days, there began a riot which Al says "would make the General Motors melees (remember them?) look like child's play." When the nonstrikers finally got through the pickets, "who were armed with clubs, bottles, pieces of pipe, and tear gas bombs," one of the crowd had been killed and 100 injured. Al ought to know

something about this little battle; he was in the crowd which crashed the picket line. Al doesn't rave about Chester as a place of beauty (in fact, he compares it to Hoboken), but he mentions that Swarthmore and Bryn Mawr are not very far away. That ought to help a bit, Al. — After three experience trips to the West Indies on the Colombian line's S.S. *Haiti*, Harrison Woodman has come ashore into the operating department of that company. — Jack Stapler has returned to Munson lines' operating department, after a short training in freight handling and pier management. Jack and Woodie have moved into a very roomy and attractive apartment at 171 West 12th Street, New York City, and their furniture is standing up pretty well in spite of New York classmates.

Carl Engstrom is an instructor of naval architecture at M.I.T., assisting Professor Owen '94, in ship design courses. We bet Carl is finding his last summer's J Class experience useful in the yacht design course this term. We would also like to bet that Carl is working on some of his own designs right now. — Charlie Miller, who since summer has been working in the marine department of the Luckenbach line, began the New Year by accepting a job with the Atlantic Mutual Insurance Company, located at 49 Wall Street, New York City. They are training Charlie in the business of marine underwriting.

And so Art ends his message without telling anything about himself. I take it he is still sailing back and forth between New York and South and Central America. I suppose we ought also to mention that Jack Stapler has had a little experience with strikes when the Munson line had one on its hands. He was so impressed by the fact that the strike was run by radicals that he is helping to organize a group to combat communism, or so we are told. A more cheerful addition to Art's news is the announcement of the engagement of Gordon Donnan to Miss

Carolyn E. Bunker of Glendale Road, Quincy, Mass. It will be recalled that Gordon's home is in nearby Wollaston. — Another engagement is that of Dick Mandelkorn, one of the XIII-A boys, to Miss Katherine Dungan, daughter of Rear Admiral P. B. Dungan of Cambridge. Miss Dungan attended the National Cathedral School in Washington, D. C., and is now studying voice at the Longy School of Music in Cambridge. A May wedding is planned. Our congratulations to both Gordon and Dick.

Course XV. Continuing our listing of those lucky in love, we come to Fletcher P. Thornton, Jr., whose engagement to Miss Margaret Kendall of Summit, N. J., has been announced. Most of us will recall that Miss Kendall is a senior at Smith this year. Meanwhile, Fletcher returns to his work with Procter and Gamble in St. Louis, Mo. Then we have the engagement of Harry T. Easton, Jr., to Miss Mary Catherine Dwyer of Winthrop, Mass. The engagement was announced at a family gathering on January 6 which included three Mary Catherine Dwyers representing three generations. We hope Harry got the right one. Miss Dwyer is a graduate of Winthrop High School and of the Chandler Secretarial School in Boston, where she was active in student affairs and has continued this interest as a member of the alumni committee. — Completing the roster of engagements for this month is that of Webster H. Wilson to Miss Marguerite von L. Brandt of Brookline, a graduate of Lasell Junior College.

Course XVI. Bus Schliemann, 47 Chapel Street, East Hartford, Conn., has a bit of news for us: Marc Warmuth now has a job with Fleetwings, Inc., of Bristol, Pa. Fleetwings has just put out an all-steel shot-welded amphibian, and Marc is in the engineering office. Also at the air show I ran into Fred Locke, who left school at the end of his sophomore year. He had been one of the mainstays of the Aeronautical Engineering Society for his

time at school, and after leaving Tech he went to Stevens, where he will finish this year. Word comes that Lombardi is now working down at Glenn L. Martin in Baltimore (see below). As far as I know, this means that all the men of our Course are employed. By the next letter, I hope to have proof of the following rumors: Dan Pearson is with the Pan American Airways in Florida. But the other rumors are even less well founded so it might be better to await the confirmation which I will let you have in the next letter.

So this leaves us waiting for more. We have a letter from Loreto Lombardi, 72 Northship Road, Dundalk, Md., telling of his work with Glenn L. Martin in the conversion department: "Our work is to change all the dimensions on all the drawings to the metric system and select Russian standard parts to replace ours, since the Martin Company is selling Russia a clipper ship 10,000 pounds heavier and 30 miles per hour faster than the *China Clipper*. It is also selling them the license to manufacture that ship in Russia; hence the conversion department."

In concluding this month's class notes, I am reminded of a couple of items about members of Course V. The name of the company for which Harry Donaldson is analytical chemist, about which I spoke last month, is the Nuodex Products Company, Elizabeth, N. J. Then we have a note that Willie Anslow is now a chemist with Rockefeller Institute. And now I can go back to my books, perhaps, until next month. — Oh, oh. I almost forgot to tell about Clax Monroe. He is no longer with Guarantee Trust Company in New York because he thought the job was leading him nowhere. When I saw him in the early part of February, he was looking for a job, but the prospects looked bright for him to land one soon. We hope so. — ANTON E. HITTLE, *General Secretary*, M.I.T. Graduate House, Cambridge, Mass.

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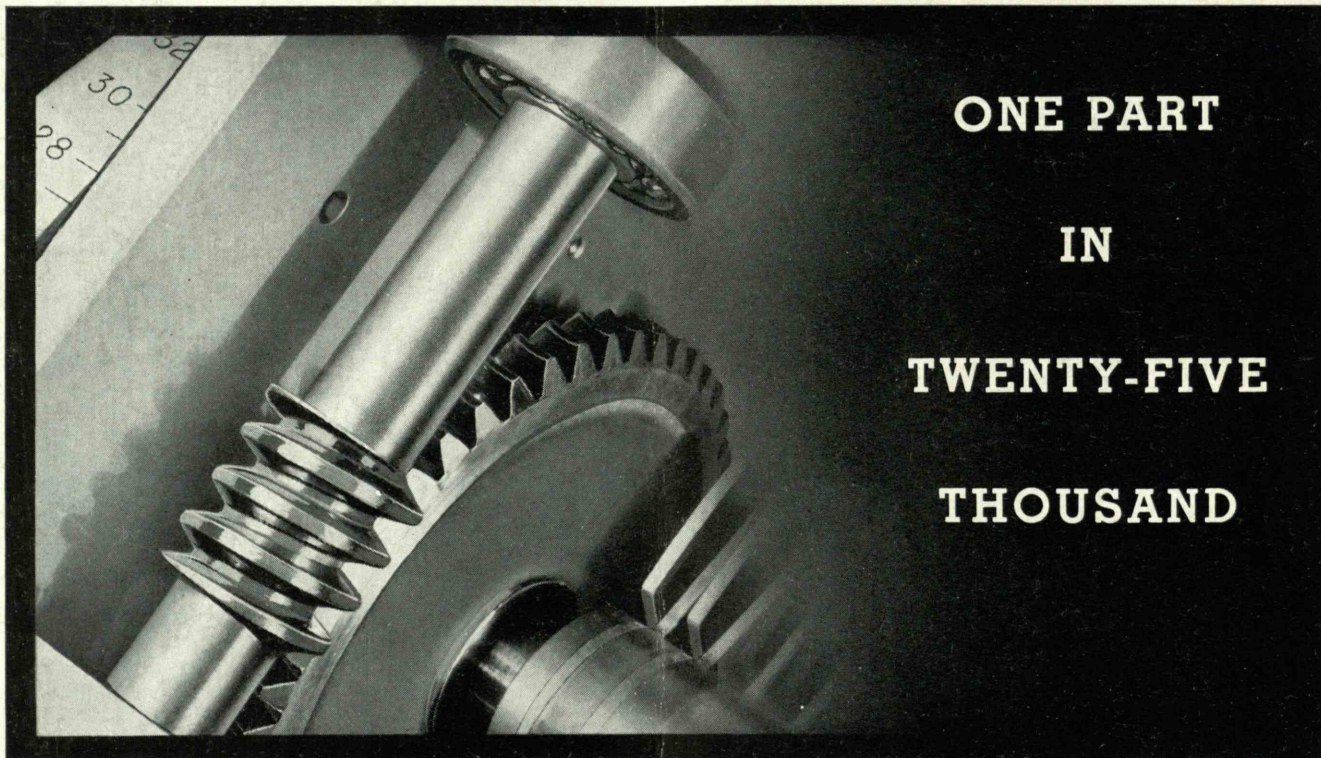
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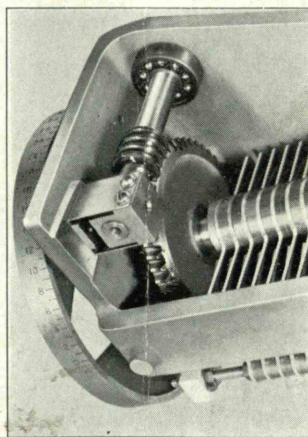
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